THE TYPE SPECIMENS AND IDENTITY OF THE SPECIES DESCRIBED IN THE GENUS *LITHOBIUS* BY R. I. POCOCK FROM 1890 TO 1901 (CHILOPODA, LITHOBIOMORPHA)

By E. H. EASON

INTRODUCTION

Of the twenty nominal species described by Pocock in the genus *Lithobius*, eight belong to the Biologia Centrali-Americana Collection presented to the British Museum (Natural History) by Messrs F. D. Godman and O. Salvin. These are all fairly easily recognizable from their original descriptions and illustrations: although few have been redescribed they have all been referred by Chamberlin not only to genera other than *Lithobius* but to a family distinct from the Lithobiidae, the Gosobiidae. The remaining twelve species were described more scantily with or without indifferent illustrations: several have been redescribed and nearly all of them have been referred by Attems or Chamberlin to genera other than *Lithobius* within the family Lithobiidae.

The descriptions which follow are based on Pocock's original material which is preserved in spirit in the British Museum (Natural History). Study of these specimens inevitably raises the question of the validity of the family Gosobiidae and of the numerous genera and subgenera in which Pocock's species have, from time to time, been placed. To use the generic names applied to each species by Attems or Chamberlin would imply recognition of the genus in question, whereas to use them for some species and not others would require explanation quite beyond the scope of this paper. Each species is, therefore, placed in *Lithobius*: but a brief explanation of the use of other generic names is given in each case.

A complete synonymy is given for each of the valid species. For those which are shown to be junior synonyms, only the names applied to them by Attems or Chamberlin before their identity was recognized are cited.

Conclusions as to the validity and status of each species are summarized in Table 1.

Finally, two specimens from India among the syntypes of *L. sculpturatus* belong to a new species which is described·

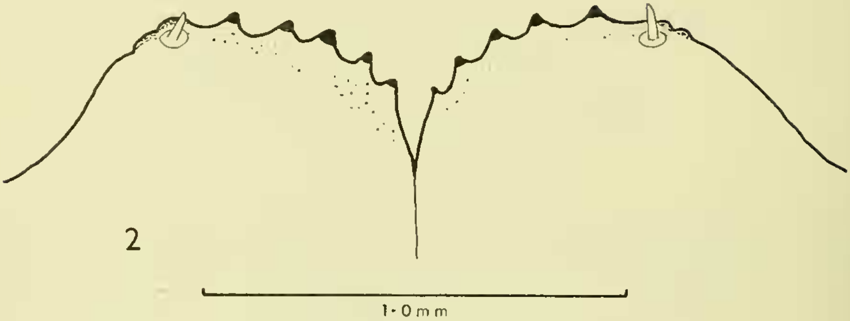
Note on the illustrations

Throughout this study, for clarity, the setae have been omitted from all the illustrations except those of the legs on which the setation may be of taxonomic importance.

1. *Lithobius macroceros* Pocock

(Figs. 1 to 3)

Lithobius macroceros Pocock, 1895a : 4, Tab. 1 figs. 3, 3a–d.
Sotimpius macroceros : Chamberlin, 1912 : 177.
? *Sotimpius multigranosus* Kraus, 1954 : 304, Taf. 28 figs. 20–23.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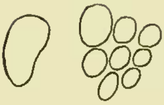
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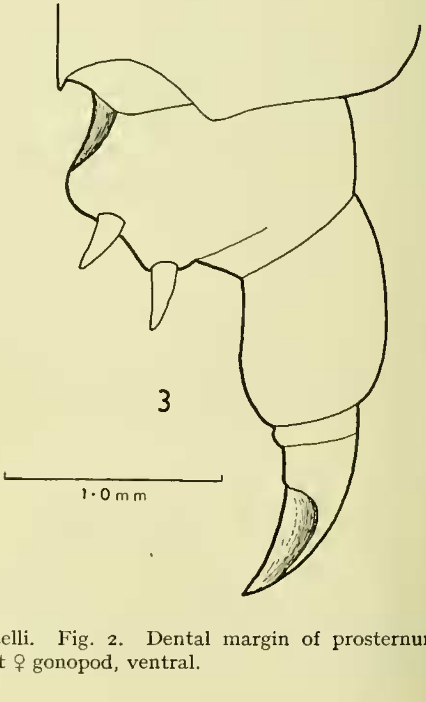
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FIGS. 1–3. *Lithobius macroceros*. Fig. 1. Ocelli. Fig. 2. Dental margin of prosternum, ventral. Fig. 3. Left ♀ gonopod, ventral.

TYPE LOCALITY. Omilteme, Guerrero, Mexico.

MATERIAL EXAMINED. A jar labelled "*Lithobius macroceros* Pocock, type, 1897.3.1.12–14" contains the following three tubes:

"Omilteme 811". A fairly well-preserved female (Reg. no. 1897.3.1.12).

"Omilteme 818". A mutilated female with the gonopods separated (Reg. no. 1897.3.1.13).

"Omilteme 820". A mutilated female pierced longitudinally by a pin (Reg. no. 1897.3.1.14).

TYPE SPECIMEN. The best preserved specimen, a female 35 mm long, is here formally designated as the lectotype (Reg. no. 1897.3.1.12).

DESCRIPTION. *Size*: 34 to 37 mm long and about 3·2 mm broad at T.10. *Colour*: dark brown. *Shape*: slender, almost parallel-sided; T.1 about as broad as T.3; body broadest at T.10. *Head*: broader than long, as broad as T.10 or broader. *Antennae*: over half body-length, of 59 irregular articles. *Ocelli*: 1 + 3, 3, 2 (Fig. 1). *Prosternum*: with 5 + 5 or 5 + 6 teeth; lateral spine much less stout than teeth at its base, probably pointed at apex in undamaged specimens, placed as far posterolateral to the lateral tooth as the interval between the two outermost teeth; on each side, adjacent to the insertion of the spine, are one or two feeble projections easily mistaken for teeth on casual examination; lateral to these projections the anterior border slopes gradually backwards without angulation; median cleft incised (Fig. 2). *Tergites*: posterior angles of T.8 rounded or blunt, those of T.10 blunt or angulated, those of T.12 angulated, those of T.14 angulated and sometimes slightly projecting; posterior emargination of large tergites very feeble or absent; large tergites unusually long for *Lithobius*, longer than broad (see Pocock 1895a: Tab. 1 fig. 3a); posterior angles of T.7 with feeble broad projections, those of T.9, 11 and 13 with narrower and more pronounced projections; intermediate tergite feebly emarginate posteriorly. *Coxal pores*: 6, 6, 6, 6; oblong. *15th leg*: barely exceeding one-third of body-length; accessory apical claw one-third of length of principal claw. *Female gonopod*: coxa markedly excavated medially at base, with two conical spurs separated from one another at their insertions by about twice their own breadth; claw simple (Fig. 3). *Male*: unknown.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	p	amp	am	—	—	mp	a	a
2	—	—	p	amp	am	—	—	mp	ap	a
3–4	—	—	(m)p	amp	am	—	—	mp	ap	a
5–6	—	—	mp	amp	am	—	—	mp	ap	ap
7	—	—	mp	amp	am	—	—	(a)mp	ap	ap
8–11	—	—	mp	amp	am	—	—	amp	ap	ap
12–13	(a)	m	amp	amp	am	—	—	amp	ap	ap
14	a	m	amp	amp	m	—	—	amp	ap	p
15	a	m	amp	amp	m	a	—	amp	—	—

Letters in brackets indicate variable spines.

REMARKS. Chamberlin (1912) noticed the medial excavation at the base of the coxa of the female gonopod (presumably in Pocock's illustration (Pocock 1895a: Tab. 1 fig. 3d) as there is no evidence of his having examined a specimen himself) and it was this feature which he used chiefly to characterize the Gosobiidae (Chamberlin 1917). *Sotimpius* (Chamberlin 1912), characterized by having numerous prosternal teeth, was erected to receive *L. macroceros* and *L. decodontus* Pocock, but both Pocock and Chamberlin (who merely copied Pocock) overstated the number of teeth by including the lateral spines.

Sotimpius multigranosus Kraus from El Salvador is so close to *L. macroceros*, from which it only differs in having rather shorter antennae, more marked posterior emargination of T.8, 10 and 12, and slightly different spinulation, that it may well prove to be conspecific.

2. *Lithobius decodontus* Pocock

(Figs. 4 and 5)

Lithobius decodontus Pocock, 1895a : 9, Tab. 1 figs. 9, 9a and b.
Sotimpius decodontus : Chamberlin, 1912 : 177 ; 1921 : 10 ; Kraus, 1954 : 303.

TYPE LOCALITY. Volcan de Acatenango, Guatemala.

MATERIAL EXAMINED. A jar labelled "*Lithobius decodontus* Pocock, type, 1894.4.1.74" contains the following two tubes :

"Volcan de Acatenango, Stoll". A well-preserved male 17 mm long.

"Quezaltenango". A mutilated male.

TYPE SPECIMEN. Pocock made it quite clear that his description was based on a single male from Volcan de Acatenango and that he was uncertain of the identity of the one from Quezaltenango. The former is therefore the holotype (Reg. no. 1894.4.1.74 (part)).

DESCRIPTION. *Size*: 17 to 19 mm long and about 2·0 mm broad at T.10. *Colour*: brown. *Shape*: almost parallel-sided ; T.1 about as broad as T.3 ; body broadest at T.10 which is barely broader than T.5 and 8. *Head*: barely broader than long, as broad as T.10. *Antennae*: almost half body-length, of 42 or 43 mostly transverse articles. *Ocelli*: 1 + 3, 3, 2 (Fig. 4). *Prosternum*: with 3 + 4 or 4 + 5 teeth; lateral spine less stout than teeth at its base, pointed at apex, placed posterolateral to lateral tooth ; lateral to the spine the anterior border slopes gradually backwards without angulation (Fig. 5). *Tergites*: posterior angles of T.8 blunt, those of T.10 blunt or angulated, those of T.12 angulated and very slightly projecting, those of T.14 angulated and distinctly projecting ; posterior borders of large tergites straight, not emarginate; large tergites rather long, as long as broad or longer but relatively shorter than in *L. macroceros*; posterior angles of T.7 with very feeble broad projections, those of T.9, 11 and 13 with narrower and more pronounced projections ; intermediate tergite feebly emarginate posteriorly. *Coxal pores*: 5, 5, 5, 5 or 4, 5, 5, 4 ; circular ; separated from one another by their own diameter. *15th leg*: almost half body-length, not swollen or otherwise modified; accessory apical claw one-third of length of principal claw. *Female*: unknown.

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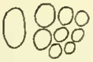

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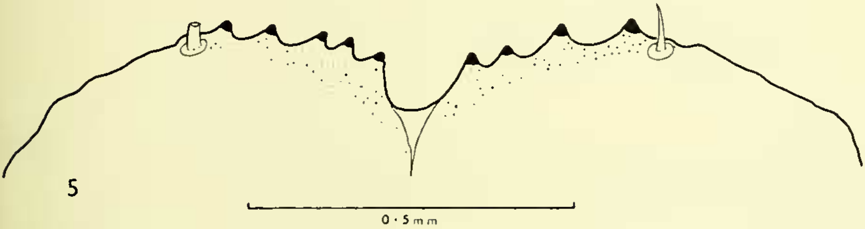


FIGS. 4–5. *Lithobius decodontus*. Fig. 4. Ocelli. Fig. 5. Dental margin of prosternum, ventral.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1–2	—	—	—	am	am	—	—	mp	a	a
3–4	—	—	p	am	am	—	—	mp	ap	a
5	—	—	p	amp	am	—	—	mp	ap	a
6–7	—	—	mp	amp	am	—	—	mp	ap	ap
8	—	—	mp	amp	amp	—	—	mp	ap	ap
9–10	—	—	mp	amp	amp	—	—	amp	ap	ap
11	—	—	p	amp	amp	—	—	amp	ap	ap
12	—	—	amp	amp	amp	(a)	—	amp	ap	ap
13	(a)	m	amp	amp	amp	(a)	—	amp	ap	ap
14	a	m	amp	amp	amp	a	—	amp	ap	ap
15	a	m	amp	amp	am	a	—	amp	p	—

Letters in brackets indicate variable spines.

REMARKS. Chamberlin's (1912) inclusion of this species in *Sotimpius* must have been on the assumption that the coxae of the female gonopods are similar to those of *L. macroceros*, as the female of *decodontus* seems never to have been described. The two species, however, are certainly closely related and probably belong to the same species-group.

Pocock recorded 6 + 4 prosternal teeth for the holotype but must have counted the rather stout right lateral spine (Fig. 5) as a tooth. He was uncertain of the identity of the male from Quezaltenango owing to the metatarsi of the anterior legs being much shorter than the corresponding tarsi, and he believed it might belong to another species. But there is no difference between this specimen and the holotype in the relative lengths of these articles and there is no doubt that they both belong to the same species.

3. *Lithobius godmani* Pocock

(Figs. 6 to 11)

Lithobius godmani Pocock, 1895a : 6, Tab. 1 figs. 6, 6a–c.
Vulcanbius godmani : Chamberlin, 1944a : 201.

TYPE LOCALITY. Amula, Guerrero, Mexico.

MATERIAL EXAMINED. A jar labelled "*Lithobius godmani* Pocock, type, 1897.3.1.16–20" contains the following five tubes :

"*Lithobius godmani* Poc. type, Amula 1085". A fairly well-preserved male (Reg. no. 1897.3.1.16).

"*Lithobius oedipes* Pocock, Amula 1087". A rather mutilated male (Reg. no. 1897.3.1.17).

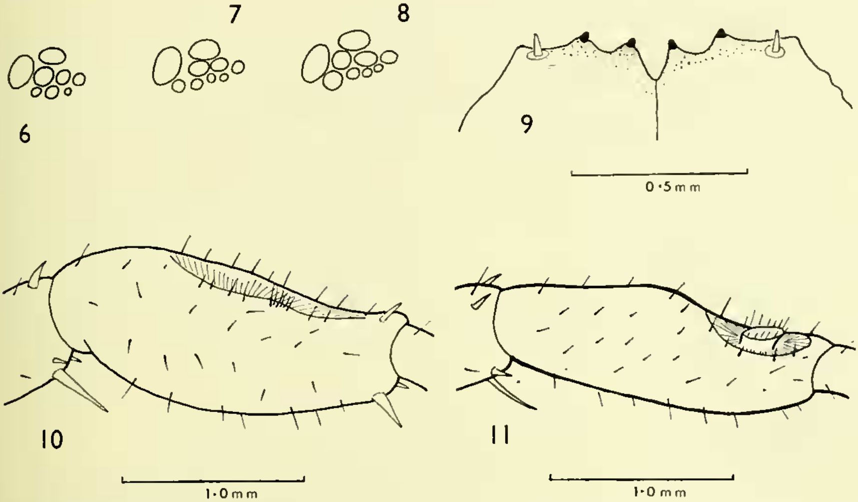
"Amula 1085". A mature male, an immature male and three immature females, all more or less mutilated (Reg. no. 1897.3.1.18).

"*Lithobius oedipes* Pocock, Amula 1086". Two males and two immature females, all in poor condition (Reg. no. 1897.3.1.19).

"1079 Amula". A very mutilated immature male (Reg. no. 1897.3.1.20).

TYPE SPECIMEN. The best preserved specimen, a male 18 mm long, is here formally designated as the lectotype (Reg. no. 1897.3.1.16).

DESCRIPTION. *Size*: 17 to 19 mm long and about 2·7 mm broad at T.8. *Colour*: brown. *Shape*: feebly fusiform ; T.1 rather narrower than T.3 ; body broadest at T.8. *Head*: broader than long, as broad as T.1. *Antennae*: over half body-length, of 50 to 53 transverse to slightly elongate articles. *Ocelli*: 1 + 1, 3, 3 or 1 + 1, 3, 4 (Figs. 6, 7 and 8). *Prosternum*: with 2 + 2 teeth ; lateral spine less stout than teeth at its base, probably setiform at apex in undamaged specimens, placed about as far lateral to the lateral tooth as the interval between lateral and medial teeth ; lateral to the spine the anterior border forms a fairly sharp angle (Fig. 9). *Tergites*: posterior angles of T.8 angulated, those of T.10 sharply pointed, those of T.12 and 14 sharp and slightly projecting ; posterior borders of large tergites straight or only feebly emarginate ; posterior angles of T.7 with broad blunt projections, those of T.9 with broad angulated projections, those of T.11 and 13 with broad sharp projections, the internal borders of which are slightly sinuous ; intermediate tergite straight posteriorly (in male). *Coxal pores*: 5, 4, 4, 4 or 5, 4, 4, 3 ; circular ; separated from one another by their own diameter or less ; specimens with 4, 3, 3, 3 pores are all immature. *15th leg*: about one-third of body-length, only slightly longer than 14th leg ; tibia modified in male ; accessory apical claw half the length of principal claw. *Male secondary sexual characters*: 14th tibia very swollen, more so internally and externally than dorsi-ventrally ; distal half to two-thirds excavated dorsally with a feeble elevation half-way along the posterior (internal) edge of the excavation bearing a tuft of setae (Fig. 10) ; 15th tibia similarly though less markedly swollen ; distal one-third excavated dorsally with a wart-like outgrowth projecting from the base of the excavation (Fig. 11). *Female gonopod*: coxa slightly excavated medially at base, with two conical spurs ; claw simple ; the external spur is much bigger than the internal which may be a feature of immaturity since all available females appear to be fourth post-larval stadia.



FIGS. 6–11. *Lithobius godmani*. Figs. 6 to 8. Ocelli. Fig. 9. Dental margin of prosternum, ventral. Fig. 10. Right 14th tibia of ♂, posterior (internal). Fig. 11. Right 15th tibia of ♂, posterior (internal).

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	mp	am	am	—	—	mp	ap	a
2	—	—	mp	amp	am	—	—	mp	ap	a
3–6	—	—	mp	amp	am	—	—	mp	ap	ap
7–10	—	—	mp	amp	am	—	—	amp	ap	ap
11	—	—	amp	amp	am	—	—	amp	ap	ap
12–14	—	m	amp	amp	am	a	—	amp	ap	ap
15	a	m	amp	amp	a	a	—	amp	ap	—

REMARKS. *Vulcanbius* was erected by Chamberlin (1944a) as a genus of Gosobiidae to receive species such as *L. godmani* showing conspicuous modification of the male 14th and 15th tibiae. But the genus was originally described as having the 14th tibia swollen, complanate and longitudinally furrowed, and the 15th tibia with a dorsal longitudinal ridge or crest. The latter part of this description hardly fits *L. godmani* and Chamberlin, who cannot have examined a specimen himself, may have misinterpreted Pocock's description.

Lithobius oedipes seems to be the name Pocock first gave to this species but he no doubt altered it to *godmani* before publication of his description, on realizing that the name was preoccupied by *L. oedipes* Bollman, 1888.

4. ***Lithobius salvini*** Pocock

(Figs. 12 to 16)

Lithobius salvini Pocock, 1895a : 7, Tab. 1 figs. 7, 7a–d.
Vulcanbius salvini : Chamberlin, 1944a : 201.

TYPE LOCALITY. Omilteme, Guerrero, Mexico.

MATERIAL EXAMINED. A jar labelled "*Lithobius salvini* Pocock, type, 1897.3.1.24–33" contains the following seven tubes :

"Omilteme 798". A fairly well-preserved male (Reg. no. 1897.3.1.25).

"Omilteme 798". Forty-one males, some immature and all more or less mutilated, of *L. salvini* together with a single mutilated male of *Neolithobius aztecus* (Humbert and Saussure). The specimen of *N. aztecus* (Reg. no. 1897.3.1.28) has now been separated from those of *L. salvini* (Reg. no. 1897.3.1.27).

"Omilteme 798". Five females, one of them immature (Reg. no. 1897.3.1.29).

"Omilteme 798". Two males and a female, all fairly well preserved, of *Lithobius humberti* Pocock (Reg. no. 1897.3.1.31–33).

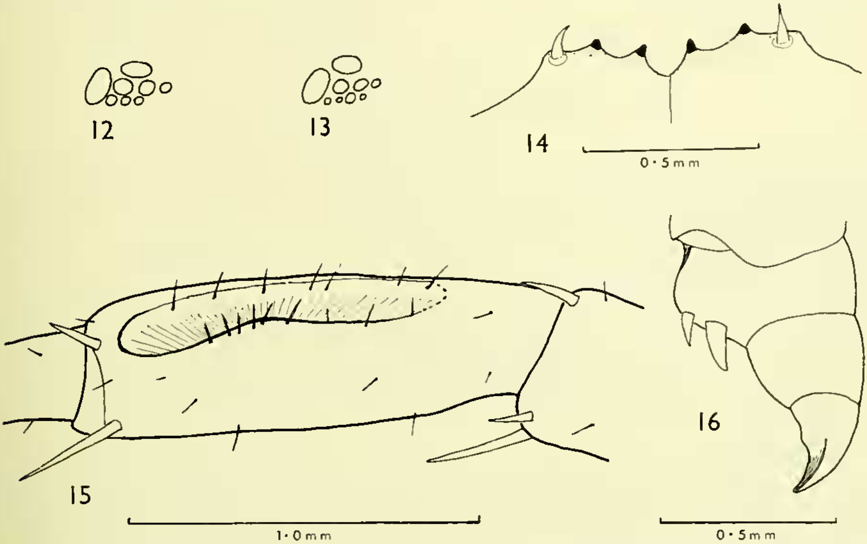
"Omilteme 811". Two bleached and desiccated females, one of them pierced longitudinally by a pin (Reg. no. 1897.3.1.30).

"Omilteme 818". A mutilated female (Reg. no. 1897.3.1.26).

"Omilteme 819". A fairly well-preserved male (Reg. no. 1897.3.1.24).

TYPE SPECIMEN. The best preserved specimen, a male 23 mm long, is here formally designated as the lectotype (Reg. no. 1897.3.1.24).

DESCRIPTION. *Size*: 18 to 25 mm long and 2·4 to 2·7 mm broad at T.8. *Colour*: brown. *Shape*: fusiform ; T.1 about as broad as T.3 ; body broadest at T.8. *Head*: broader than long, as broad as T.3. *Antennae*: half body-length or more, of 49 to 56 irregular articles. *Ocelli*: 1 + 1, 3, 3 or 1 + 1, 3, 4 (Figs. 12 and 13). *Prosternum*: with 2 + 2 (rarely 2 + 3) teeth ; lateral spine almost as stout as teeth at its base, setiform at apex in undamaged specimens, placed lateral to the lateral tooth at a distance rather less than the interval between lateral and medial teeth ; immediately adjacent to the insertion of the spine the anterior border forms a prominent rounded angle (Fig. 14) ; in some of the largest specimens the teeth are small so that the lateral spine appears relatively stouter. *Tergites*: posterior angles of T.8 angulated or blunt, those of T.10 angulated, those of T.12 and 14 angulated and slightly projecting ; posterior borders of T.1, 3 and 5 almost straight, those of T.8, 10 and 12 distinctly emarginate, that of T.14 straight or emarginate ; posterior angles of T.6 with well-developed rounded projections in some of the larger specimens only, but in most specimens including the lectotype they are simply rounded ; posterior angles of T.7 with broad blunt or angulated projections, those of T.9, 11 and 13 with broad sharp projections, the least broad on T.13 ; intermediate tergite straight or feebly emarginate posteriorly. *Coxal pores*: 4, 3, 3, 3 ; circular ; separated from one another by their own diameter or less ; one of the largest specimens has 5, 4, 4, 4 pores and the smaller specimens, all immature, have 3, 2, 2, 2. *15th leg*: a quarter to almost one-third of body-length, about the same length as 14th leg ; tibia slightly modified in male ; accessory apical claw half the length of principal claw. *Male secondary sexual characters*: 14th tibia moderately swollen, more so internally and externally than dorsi-ventrally, and excavated dorsally; the excavation may be limited to the distal one-third of the article or may be more extensive and is shallow proximally, becoming deeper distally, with an indefinite elevation along its posterior (internal) edge bearing an ill-defined group of setae (Fig. 15); 15th tibia slightly swollen with only a trace of dorsal excavation. *Female gonopod*: coxa slightly excavated medially at base, with two conical spurs; claw simple; the external spur is bigger than the internal and this seems to be an adult feature (Fig. 16).



FIGS. 12–16. *Lithobius salvini*. Figs. 12 and 13. Ocelli. Fig. 14. Dental margin of prosternum, ventral. Fig. 15. Left 14th tibia of ♂, posterior (internal). Fig. 16. Left ♀ gonopod, ventral.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	mp	am	a	—	—	mp	ap	a
2	—	—	mp	amp	am	—	—	mp	ap	a
3–5	—	—	mp	amp	am	—	—	mp	ap	ap
6	—	—	mp	amp	am	—	—	(a)mp	ap	ap
7–8	—	—	mp	amp	am	—	—	amp	ap	ap
9	—	(m)	(a)mp	amp	am	—	—	amp	ap	ap
10–11	—	(m)	amp	amp	am	—	—	amp	ap	ap
12–13	—	m	amp	amp	am	(a)	—	amp	ap	ap
14	—	m	amp	amp	am	a	—	amp	ap	ap
15	(a)	m	amp	amp	a	a	—	amp	(a)p	—

Letters in brackets indicate variable spines. Coxolateral spines (VaC) present in only a few specimens including the lectotype.

REMARKS. Chamberlin (1944a) included this species in *Vulcanbius* along with *L. godmani*; but as in the case of *godmani*, *salvini* agrees with Chamberlin's definition of the genus in respect of the 14th tibia but not of the 15th.

Pocock suspected that *godmani* and *salvini* might be no more than forms of the same species, but in spite of their similarity and almost identical spinulation they are sufficiently different to be regarded as distinct. Brölemann (1900) suggested that *Lithobius guatemalae* Brölemann might be identical with one or other of these species, but *guatemalae*, though probably closely related to both *godmani* and *salvini* cannot, from Brölemann's rather brief description, be regarded as identical with either.

5. ***Lithobius vulcani*** Pocock

(Figs. 17 to 21)

Lithobius vulcani Pocock, 1895a : 8, Tab. 1 figs. 8, 8a and b.
Labrobius vulcani : Chamberlin, 1915 : 536 ; 1921 : 9.
Vulcanbius vulcani : Chamberlin, 1944a : 201.
Sotimpius zilchi Kraus, 1954 : 300, Taf. 27 figs. 10–14.

TYPE LOCALITY. Volcan de Agua, Guatemala.

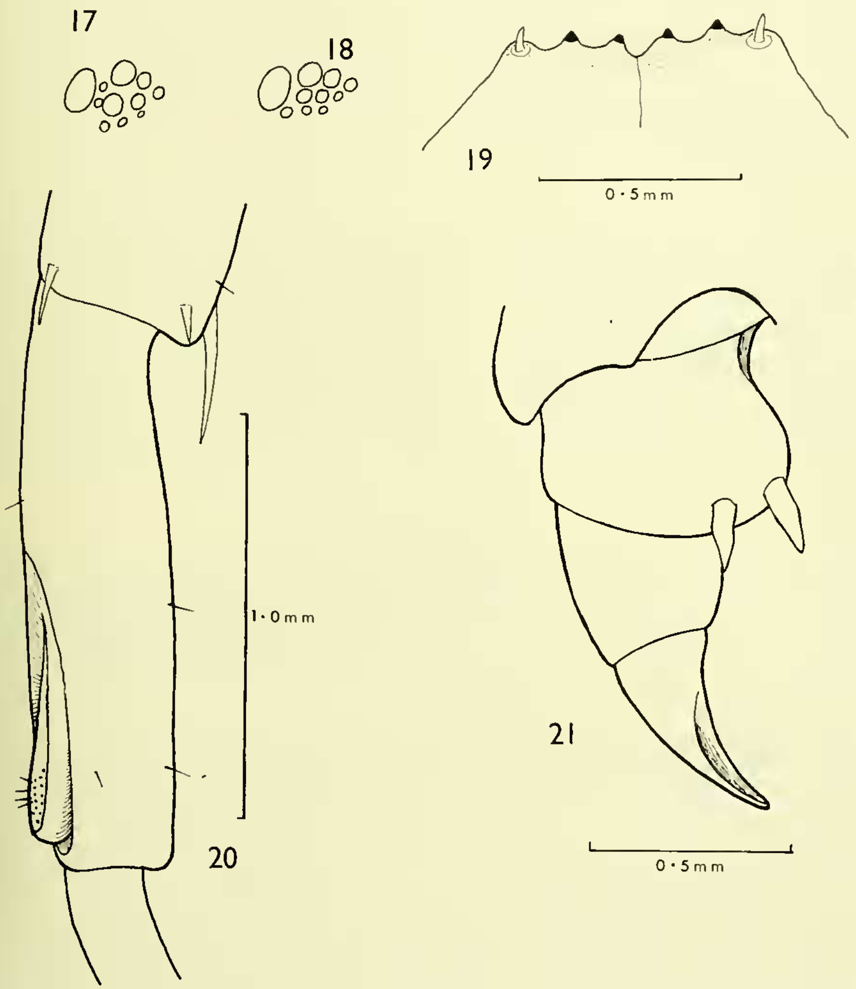
MATERIAL EXAMINED. A jar labelled "*Lithobius vulcani* Pocock type, 1894.4.1.72–73" contains the following two tubes:

"Volcan de Agua". A fairly well-preserved male (Reg. no. 1894.4.1.72).

Unlabelled. A female and an immature male, both fairly well preserved (Reg. no. 1894.4.1.73).

TYPE SPECIMEN. Pocock made it quite clear that his description was based on a single adult male, so that the above male labelled "Volcan de Agua" is the holotype (Reg. no. 1894.4.1.72).

DESCRIPTION OF HOLOTYPE. *Size:* 17·5 mm long and 2·2 mm broad at T.10. *Colour*: pale brown. *Shape*: fusiform; T.1 rather narrower than T.3; body broadest at T.10. *Head*: broader than long, as broad as T.5. *Antennae*: 6·0 mm long, of 41 mostly transverse articles. *Ocelli*: 1 + 10; those of the main mass are irregular and cannot be represented by a formula (Fig. 17). *Prosternum*: with 2 + 2 teeth; lateral spine less stout than teeth at its base, probably setiform at apex in undamaged specimens, placed about as far lateral to the lateral tooth as the interval between lateral and medial teeth; immediately adjacent to the insertion of the spine the anterior border forms a distinct rounded angle (Fig. 19). *Tergites*: posterior angles of T.8 and 10 blunt, those of T.12 angulated, those of T.14 angulated and slightly projecting; posterior borders of T.1, 3, 5 and 8 almost straight, those of T.10, 12 and 14 feebly emarginate; posterior angles of T.9, 11 and 13 with triangular projections; intermediate tergite straight posteriorly. *Coxal pores*: 4, 4, 4, 4 and 4, 4, 4, 3; circular; separated from one another by more than their own diameter. *14th leg*: 4·6 mm long; tibia slightly modified. *15th leg*: 5·2 mm long; tibia modified; accessory apical claw half the length of principal claw. *Male secondary sexual characters*: 13th tibia very slightly swollen; 14th tibia moderately swollen, fusiform; 15th tibia slightly swollen, excavated posterodorsally over rather more than its distal half; from the base of the excavation rises a crest which becomes increasingly prominent distally and terminates abruptly just short of the distal end of the article (Fig. 20).



FIGS. 17–21. *Lithobius vulcani*. Figs. 17 and 18. Ocelli. Fig. 19. Dental margin of prosternum, ventral. Fig. 20. Left 15th tibia of ♂, posterior (internal). Fig. 21. Right ♀ gonopod, ventral.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	p	m	am	—	—	p	a	a
2	—	—	p	m	am	—	—	p	ap	ap
3	—	—	p	am	am	—	—	mp	ap	ap
4	—	—	p	amp	am	—	—	mp	ap	ap
5	—	—	mp	amp	am	—	—	mp	ap	ap
6–9	—	—	mp	amp	am	—	—	amp	ap	ap
10–12	—	—	amp	amp	am	—	—	amp	ap	ap
13–14	—	m	amp	amp	am	—	—	amp	ap	ap
15	—	m	amp	amp	a	—	—	amp	p	—

Coxal spines (VaC and DaC) absent or broken. VmT of 5th leg (for example) over half the length of 5th tibia.

DESCRIPTION OF FEMALE. Differing from the male holotype in the following characters: *Size*: 19 mm long and 2·4 mm broad at T.10. *Antennae*: of 36 articles. *Ocelli*: 1 + 3, 3, 3 (Fig. 18). *Tergites*: posterior border of T.14 markedly emarginate; intermediate tergite relatively broad. *Coxal pores*: 6, 6, 6, 6 and 6, 6, 5, 5. *14th leg*: 5·8 mm long; tibia not modified. *15th leg*: 7·0 mm long; tibia not modified. *Spinulation*: coxolateral spine (VaC) present on 15; VmP absent on 5; VaF present on 1 and 2; DaC present on 15; DaP present on 5; DmP present on 1 and 2; DpF present on 1; DpT absent on 2. *Gonopod*: coxa markedly excavated medially at base, with two conical spurs separated from one another at their insertions by rather more than their own breadth; claw simple (Fig. 21).

DESCRIPTION OF IMMATURE MALE. Differing from the holotype in the following characters: *Size*: 14 mm long. *Antennae*: of 32 articles. *Ocelli*: as in female. *Tergites*: posterior angles of T.10 angulated, those of T.12 angulated and slightly projecting. *Coxal pores*: 3, 4, 4, 3. *Legs*: of much the same relative lengths as in holotype; no modification of 13th, 14th or 15th tibia. *Spinulation*: coxolateral spine (VaC) present on right 15th leg only; DaC present on both 15th legs; anterior limits of spine-series not recorded.

REMARKS. *Labrobius* was erected by Chamberlain (1915) as a genus of Gosobiidae to receive a number of species, including *L. vulcani*, showing a conspicuous crest on the male 15th tibia; but he later restricted the genus to exclude those species showing obvious modification of any other article (Chamberlin 1943). *L. vulcani* seems to be the only one of Pocock's Central American species of *Lithobius* which Chamberlin actually examined himself and he must finally have decided that the swelling of the male 14th tibia was sufficient grounds for excluding it from *Labrobius* and including it in *Vulcanbius* (Chamberlin 1944a). But there is only moderate swelling of the 14th tibia in the holotype without any sulcus or excavation, and Kraus (1954) found only slight dorsal flattening of this article in *zilchi* (=*vulcani*). *L. vulcani*, therefore, agrees with *Vulcanbius* in the structure of the 15th tibia but not in that of the 14th and there seems little reason for including it in the same species-group as *L. godmani* and *L. salvini*, where the opposite obtains (see p. 47), on the basis of the structure of the 14th and 15th legs.

Kraus (1954) saw no reason for separating *zilchi* generically from a number of species of *Sotimpius* (*sensu* Chamberlin) he described from El Salvador. He distinguished it from *vulcani* by means of its more numerous ocelli, the very long ventral spines on the tibiae of the foremost legs, and the more numerous setae on the male 15th tibial crest. In fact, Pocock understated the number of ocelli in the holotype of *vulcani* and made no special mention of the length of the ventral tibial spines (VmT) which are just as long on the foremost legs of the holotype as those described by Kraus for *zilchi*. The setae on the 15th tibia of the holotype (Fig. 20) are certainly meagre compared with those illustrated by Kraus in a comparable figure of *zilchi* (Kraus 1954 : Taf. 27 fig. 13) ; but many of them have obviously been lost and had probably been lost before Pocock drew his figure (Pocock 1895a : Tab. 1 fig. 8b) which was all Kraus had to guide him. There is little doubt that *zilchi* and *vulcani* are identical.

It is possible that the female and immature male in the unlabelled tube belong to a species other than *L. vulcani* because of the different arrangement of the ocelli and the presence of the coxal spines VaC and DaC on the 15th legs. However, Kraus mentioned the variability of the ocelli in *zilchi* and figured an arrangement (Kraus 1954 : Taf. 27 fig. 11) very similar to that found in these two specimens (Fig. 18) : he found no coxal spines and the probabilty is that these spines are variable in *L. vulcani* and that all three of Pocock's specimens are conspecific.

6. ***Lithobius pontifex*** Pocock

(Figs. 22 to 24)

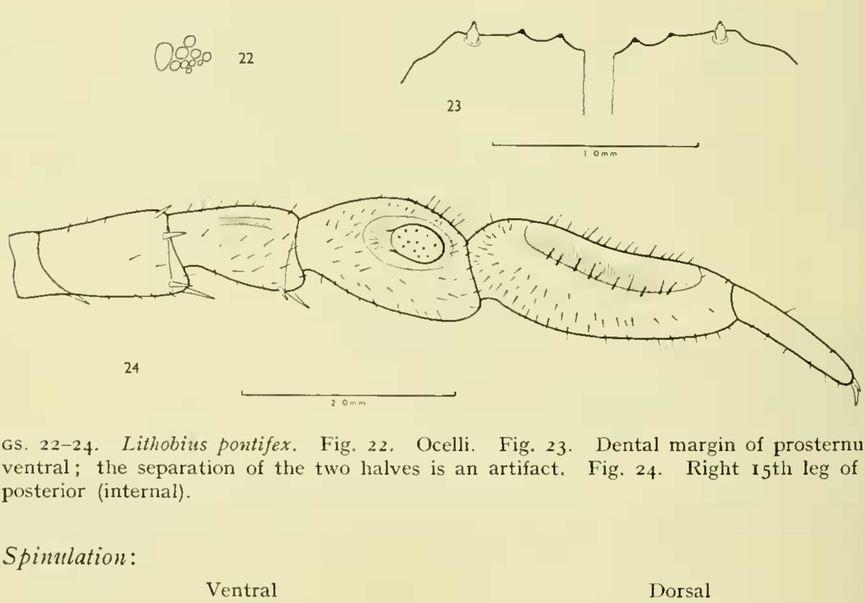
Lithobius pontifex Pocock, 1895a : 5, Tab. 1 figs. 4, 4a–d.
Arenobius (*Kunobius*) *pontifex* : Chamberlin, 1912 : 178.
Guerrobius pontifex : Chamberlin, 1942 : 20.

Type locality. Amula, Guerrero, Mexico.

Material examined. A jar labelled "*Lithobius pontifex* Pocock, type, 1897.3.1.15 Amula, 6,000′, Godman and Salvin, Biol. Centr. Amer." contains a tube labelled "Amula 1085". A male with most of the legs missing and the right 15th leg separate in a microvial.

Type specimen. Pocock's description is of a single male and the above specimen is the holotype (Reg. no. 1897.3.1.15).

Description of holotype. *Size*: 27 mm long and 3·8 mm broad at T.5. *Colour*: dark brown. *Shape*: attenuated posteriorly; T.1 narrower than T.3; body broadest at T.5. *Head*: broader than long, narrower than T.1, about as broad as T.12. *Antennae*: 12 mm long, of 52 and 55 irregular articles. *Ocelli*: 1 + 1, 3, 4, 1 (Fig. 22). *Prosternum* : with 2 + 2 small teeth ; lateral spine pigmented, short and blunt, much stouter than teeth, placed further lateral to the lateral tooth than the interval between lateral and medial teeth ; lateral to the spine the anterior border forms a feeble rounded angle ; median cleft very shallow (Fig. 23). *Tergites*: posterior angles of T.8 blunt, those of T.10 angulated, those of T.12 and 14 angulated and slightly projecting ; posterior borders of large tergites only feebly emarginate ; posterior angles of T.6 with distinct rounded projections, those of T.7 with rather broader rounded projections, those of T.9, 11 and 13 with broad sharp projections ; intermediate tergite very feebly emarginate posteriorly. *Coxal pores*: 5, 4, 4, 4 ; circular or somewhat reniform ; separated from one another by less than their own diameter. *15th leg*: 7·4 mm long, about the same length as 13th leg ; according to Pocock much shorter than 14th leg which is now missing ; tibia and tarsus modified ; accessory apical claw half the length of principal claw. *Male secondary sexual characters*: 14th leg unmodified according to Pocock ; 15th femur with a feeble dorsal sulcus ; 15th tibia very swollen, excavated posterodorsally with a flat wart-like outgrowth occupying most of the excavation ; 15th tarsus even more swollen, extensively and deeply excavated posterodorsally (Fig. 24).



FIGS. 22–24. *Lithobius pontifex*. Fig. 22. Ocelli. Fig. 23. Dental margin of prosternum, ventral; the separation of the two halves is an artifact. Fig. 24. Right 15th leg of ♂, posterior (internal).

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
13	—	m	amp	amp	am	a	—	amp	ap	ap
15	—	m	amp	amp	a	a	—	amp	—	—

REMARKS. Chamberlin (1912) erected *Arenobius* to receive most of the species then known to him which he later (1915) assigned to the Gosobiidae. *Kunobius* (Chamberlin 1912) was erected as a subgenus of *Arenobius* to receive such species as *L. pontifex* and *L. humberti* Pocock which, while having some modification of the male 15th legs, have the 14th legs unmodified. Chamberlin made no mention of

Kunobius in any of his writings subsequent to 1912 and redefined *Arenobius* (Chamberlin 1917) to exclude all species other than the type species *L. manegitus* Chamberlin. He later erected *Guerrobius* (Chamberlin 1942), characterized quite positively by conspicuous modification of the male 15th tibia and tarsus, to receive *L. pontifex* and *L. humberti* with *pontifex* as type species. But in a more recent definition of *Guerrobius* (Chamberlin 1943) he restricted it to those species with relatively slender lateral prosternal spines, thus excluding the type species. This lapse on Chamberlin's part must have been due to his misinterpretation of Pocock's description of *L. pontifex*.

7. ***Lithobius humberti*** Pocock

(Figs. 25 to 29)

Lithobius humberti Pocock, 1895a : 5, Tab. 1 figs. 5, 5a–c.
Arenobius (*Kunobius*) *humberti* : Chamberlin, 1912 : 178.
Guerrobius humberti : Chamberlin, 1942 : 20.

TYPE LOCALITY. Omilteme, Guerrero, Mexico.

MATERIAL EXAMINED. A jar labelled " *Lithobius humberti* Pocock, type, 1897.3.1.21–23 " contains the following two tubes :

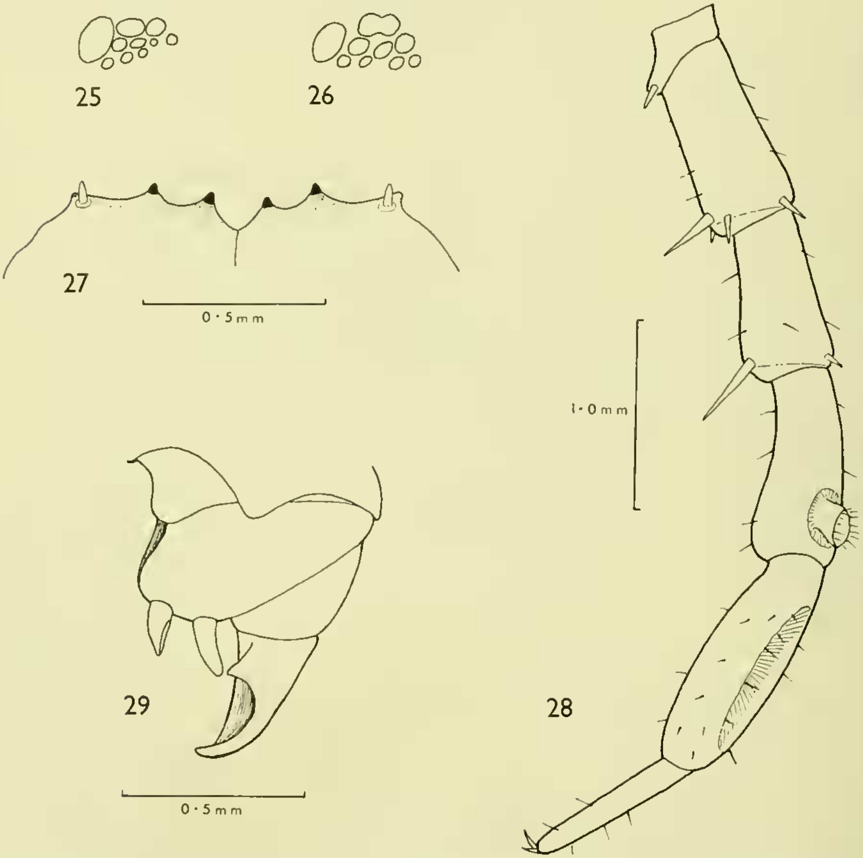
" Omilteme 703 ". A rather mutilated male (Reg. no. 1897.3.1.21).

" Omilteme 703 ". A mutilated female of *L. humberti* together with an immature male of *L. salvini*. The specimen of *L. humberti* (Reg. no. 1897.3.1.22) has now been separated from that of *L. salvini* (Reg. no. 1897.3.1.23).

The three specimens of *L. humberti* (Reg. no. 1897.3.1.31–33) originally placed in the jar with those of *L. salvini* (see p. 48) have also been examined.

TYPE SPECIMEN. Pocock's description was based on two males and a female and the presumption is that the specimens in the jar labelled " *Lithobius humberti* " are the syntypes, in spite of the fact that one was misdetermined and the others are in poor condition. The adult male, 18 mm long with the left 15th leg missing, is here formally designated as the lectotype (Reg. no. 1897.3.1.21). Much of the following description, however, is based on the misplaced specimens which are in better condition.

DESCRIPTION. *Size*: 15 to 18 mm long and 2·2 to 2·6 mm broad at T.8. *Colour*: dark brown. *Shapé*: feebly fusiform ; T.1 rather narrower than T.3 ; body broadest at T.5 or 8. *Head*: as broad as long, about as broad as T.3. *Antennae*: usually over half body-length, of 50 to 52 irregular articles, but in the lectotype barely one-third of body-length with 38 articles. *Ocelli*: 1 + 2, 4, 3 or 1 + 1, 3, 4 (Figs. 25 and 26). *Prosternum*: with 2 + 2 teeth ; lateral spine less stout than teeth at its base, peg-like, placed further lateral to the lateral teeth than the interval between lateral and medial teeth ; immediately adjacent to the insertion of the spine the anterior border forms a fairly sharp angle (Fig. 27). *Tergites*: as in *L. pontifex* but the posterior projections on T.7 are broader and less evenly rounded. *Coxal pores*: 4, 4, 3, 3 ; 4, 4, 4, 3 or 5, 4, 4, 3 in males ; 5, 4, 4, 4 in females ; circular ; separated from one another by their own diameter. *15th leg*: barely exceeding a quarter of body-length, rather shorter than 14th leg in males; about two-fifths of body-length, longer than 14th leg in females; tibia and tarsus modified in male; accessory apical claw half the length of principal claw. *Male secondary sexual characters*: 14th leg unmodified; 15th tibia slightly swollen distally, with a circular excavation on the posterodorsal aspect of its distal one-third, from which projects a prominent wart-like outgrowth; 15th tarsus more markedly swollen, extensively excavated posterodorsally (Fig. 28). *Female gonopod*: coxa slightly excavated medially at base, with two fairly stout spurs separated from one another at their insertions by their own breadth; claw simple with a conspicuous tooth at its base (Fig. 29).



FIGS. 25–29. *Lithobius humberti*. Figs. 25 and 26. Ocelli. Fig. 27. Dental margin of prosternum, ventral. Fig. 28. Right 15th leg of ♂, posterior (internal). Fig. 29. Left ♀ gonopod, ventral.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	—	m	m	—	—	mp	a	—
2	—	—	p	amp	am	—	—	mp	ap	a
3–7	—	—	mp	amp	am	—	—	mp	ap	ap
8–11	—	—	amp	amp	am	—	—	amp	ap	ap
12–14	—	m	amp	amp	am	—	—	amp	ap	ap
15	—	m	amp	am	a	a	—	amp	ap	—

The above is the usual spinulation but, on the 15th legs, DaC may be absent and in the only female with these legs intact VpF, DaT and DpT are present.

REMARKS. The history of the generic classification of *L. humberti* is the same as that of *L. pontifex*. These two species are very close to one another and there is every reason for including them in the same species-group, in spite of the fact that the female of *L. pontifex* is unknown.

8. **Lithobius stolli** Pocock

(Figs. 30 to 32)

Lithobius stolli Pocock, 1895a : 9, Tab. 1 figs. 10, 10a–c.
Arenobius (*Sowubius*) *stolli* : Chamberlin, 1912 : 178.
Sowubius stolli : Chamberlin, 1921 : 10.

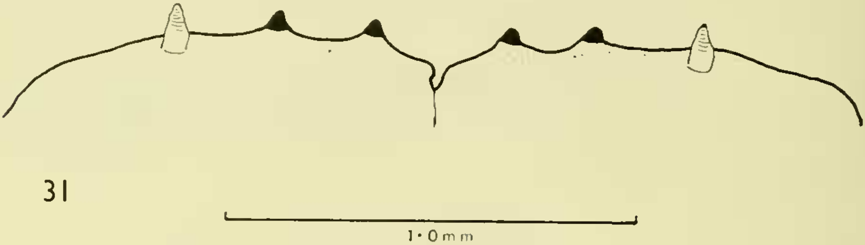
TYPE LOCALITY. Volcan de Agua, Guatemala.

MATERIAL EXAMINED. A jar labelled " *Lithobius stolli* Pocock, type, 1894.4.1.76 " contains a tube labelled " Volcan de Agua 9,000–10,000′ ". A female of *Lithobius castaneus* Newport, 1844, fairly well preserved but with the 15th legs missing.

TYPE SPECIMEN. Pocock's description is of a single female and the above specimen is the holotype (Reg. no. 1894.4.1.76).

DESCRIPTION OF HOLOTYPE. *L. castaneus* is a well-known Mediterranean species but this specimen differs in detail from Brölemann's (1930) account and is therefore described below.

Size: 27 mm long and 3·8 mm broad at T.10. *Colour*: brown with a darker dorsal median band on the more posterior tergites. *Shape*: almost parallel-sided; T.1 broader than T.3; body broadest at T.10. *Head*: rather longer than broad, as broad as T.1; a pair of short faint paramedian sulci run forwards on either side from the posterior marginal sulcus. *Antennae*: 12·2 mm long, of 27 elongate articles, each article being two or three times longer than broad. *Ocelli*: 1 + 5, 5, 6, 6, 4 (Fig. 30). *Prosternum*: with 2 + 2 small teeth; lateral spine short and blunt, stouter than teeth, placed as far lateral to the lateral tooth as the interval between lateral and medial teeth; lateral to the spine the anterior border forms a broad level shoulder before sloping backwards without angulation; median cleft essentially shallow with a minute secondary cleft in the mid-line (Fig. 31). *Tergites*: large tergites with posterior angles rounded and posterior borders emarginate; posterior angles of T.9 and 11 squared, those of T.13 with traces of projections; on T.1, 3 and 5 the marginal sulcus is interrupted posteriorly and curved forwards on either side; this sculpturing is repeated faintly on T.8, 10 and 12; intermediate tergite quite strongly emarginate posteriorly. *Coxal pores*: 9, 9, 9, 9; oval to oblong. *14th leg*: 9·2 mm long; accessory apical claw a quarter the length of principal claw. *15th leg*: missing; according to Pocock the accessory apical claw is absent. *Gonopod*: coxa without trace of medial excavation at base, with two short acuminate spurs separated from one another at their insertions by barely their own breadth; claw simple (Fig. 32).



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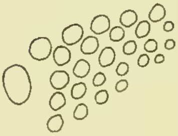

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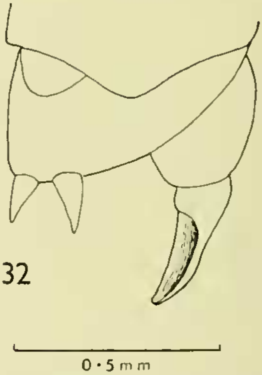

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FIGS. 30–32. *Lithobius stolli*. Fig. 30. Ocelli. Fig. 31. Dental margin of prosternum, ventral. Fig. 32. Left ♀ gonopod, ventral.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	mp	amp	am	—	—	amp	ap	ap
2–11	—	—	amp	amp	am	—	—	amp	ap	ap
12	—	m	amp	amp	am	a	—	amp	ap	ap
13	a	m	amp	amp	am	a	—	amp	ap	ap
14	a	m	amp	amp	am	a	—	amp	ap	p
15	a	1	3	2	1	a				

On the 14th leg VaT and DaF are present on one side only. The numerals indicate the ventral spinulation given by Pocock for the telopodite of the 15th leg.

REMARKS. *Sowubius* was erected by Chamberlin (1912) as a monotypic subgenus of *Arenobius*, characterized by the absence of posterior tergal projections and the absence of a 15th accessory apical claw, to receive *L. stolli*. It was later raised to a genus (Chamberlin 1921). Pocock's illustration of the gonopod of *L. stolli* shows no trace of basal constriction of the coxa (Pocock 1895a : Tab. 1 fig. 10c) and Chamberlin had, therefore, little justification for including this species in *Arenobius* and later in the Gosobiidae (see p. 44). Pocock's illustration is, however, on too small a scale to show the detailed structure of the gonopod and Chamberlin may have assumed the base of the coxa to be excavated as it is in the majority of neotropical forms : he may also have been influenced by the simple genital claw, another feature he regarded as characteristic of the Gosobiidae, which is clearly shown in Pocock's illustration.

The holotype of *L. stolli* has been compared with a number of examples of *L. castaneus* from Europe and North Africa and also with the holotype of *L. castaneus* Newport in the British Museum (Natural History) (see also Eason 1972) and there is no doubt as to its identity. *Sowubius* thus becomes the senior synonym of *Euporodontus*, a genus erected by Verhoeff (1942) with *L. castaneus* Newport as type species.

In view of the historical association between Central America and Spain, where *L. castaneus* is common, artificial introduction seems the most likely explanation of the presence of this species in Guatemala.

9. ***Lithobius provocator*** Pocock

Lithobius provocator Pocock, 1891a : 152 ; 1893 : 122 ; Chamberlin, 1904 : 653 ; 1920a : 280, Pl. xxix figs. 6–8.
Eremobius provocator : Chamberlin, 1925 : 408.

TYPE LOCALITY. Bermuda.

MATERIAL EXAMINED. A jar labelled "*Lithobius provocator* Pocock, type, Bermuda, Challenger" contains two females, two adult males and an immature male, all more or less mutilated, belonging to *Lithobius peregrinus* Latzel, 1880 (Reg. no. 1892.12.1.16–20).

TYPE SPECIMENS. All the above specimens are syntypes.

DESCRIPTION. The specimens are all quite typical and answer to Chamberlin's (1920a) description of *L. provocator* and Brölemann's (1930) description of *L. peregrinus*. The position of the lateral prosternal spines medial to the respective lateral teeth in *peregrinus* was not made clear by Brölemann but was adequately described and figured by Matic (1957 : 13, figs. 4 and 5).

REMARKS. Pocock (1893) realized that this was not an "Antillean" species and suspected that it might be a form of the European *L. forficatus* (Linn.). Chamberlin (1920a) gave a full description of *L. provocator* based on Bermudan material and later (Chamberlin 1925) erected *Eremobius* as a monotypic genus, characterized by the arrangement of the prosternal spine and teeth, to receive it. Synonymy of *L. provocator* with *L. peregrinus* was first proposed by Jeekel (1963).

Lithobius ethochaetus, which was described from a single female taken at New Orleans in a cargo from Panama (Chamberlin 1938), undoubtedly belongs to *L. peregrinus*. A record of *peregrinus* from an inland locality in South Africa (Attems 1928) is further evidence of the extent to which this species, whose natural range is in southern and central Europe, has been artificially spread.

10. ***Lithobius sydneyensis*** Pocock

(Figs. 33 to 36)

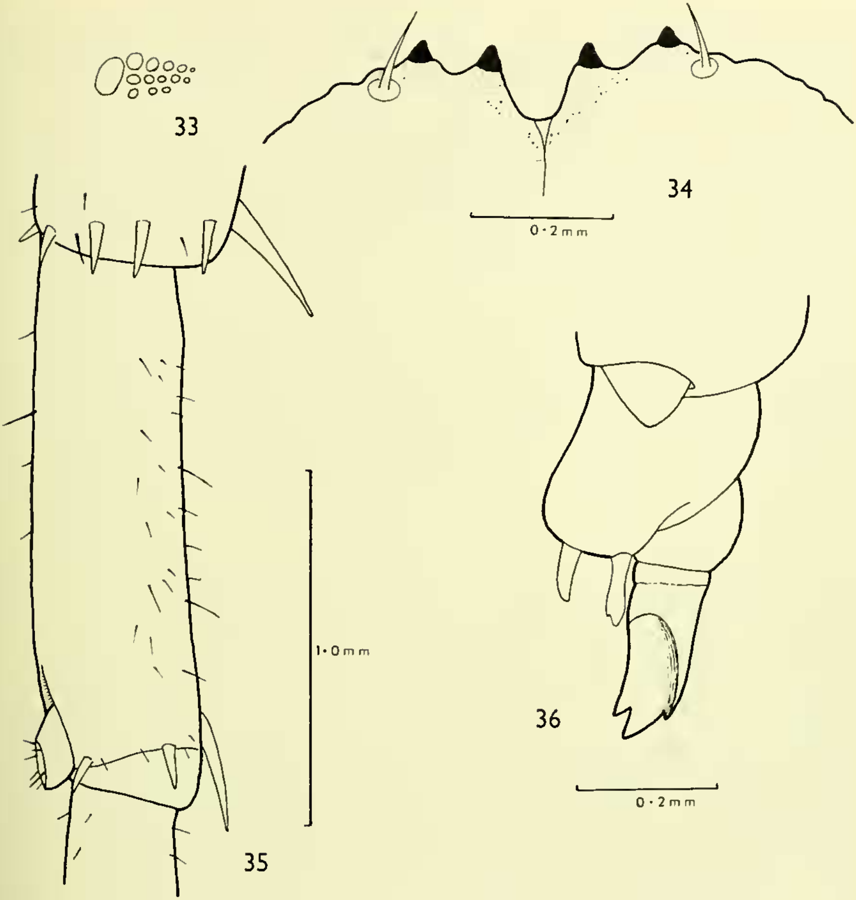
Lithobius sydneyensis Pocock, 1891a : 153; Attems, 1914 : 97.
Lithobius bermudensis Pocock, 1893 : 126.
Walesobius sydneyensis : Chamberlin, 1920b : 77; Archey, 1937 : 72, Pl. 16 figs. 1–6.
Lithobius araïchensis Brölemann, 1924a : 58, figs. 4–6; 1924b : 187; 1932 : 55; Matic, 1959 : 18, fig. 3; 1968 : 71; Demange, 1962 : 138; Matic *et al.*, 1967 : 192.
Walesobius excrescens Attems, 1928 : 78.
? *Lithobius platensis* Gervais : Silvestri, 1899 : 142.
? *Chilebius coquimbo* Chamberlin, 1955 : 56.
? *Andebius callao* Chamberlin, 1955 : 57.

TYPE LOCALITY. Sydney, Australia.

MATERIAL EXAMINED. A jar labelled "*Lithobius sydneyensis* Pocock, type, Sydney, Brazier" contains a male and a female, both well preserved, and two mutilated males, one of them immature (Reg. no. 1972.738–740).

TYPE SPECIMEN. The well-preserved male, 15 mm long, is here formally designated as the lectotype and has now been placed in a separate tube (Reg. no. 1972.738).

DESCRIPTION. *Size*: 15 to 19 mm long and 2·0 to 2·4 mm broad at T.10. *Colour*: pale brown. *Shape*: fusiform; T.1 as broad as T.3 or rather broader; body broadest at T.8 or 10. *Head*: barely broader than long, as broad as T.5. *Antennae*: two-fifths of body-length, of 26 to 28 slightly elongate fairly regular articles. *Ocelli*: 1 + 5, 5, 3 (Fig. 33) or, on the left side of the female, 1 + 6, 5, 4, 2. *Prosternum*: with 2 + 2 teeth, the medial tooth the larger; lateral spine setiform but stouter than the largest seta, placed posterolateral to lateral tooth; lateral to the spine the anterior border forms an irregular shoulder (Fig. 34). *Tergites*: posterior angles of T.8 and 10 rounded or blunt, those of T.12 blunt, those of T.14 rounded or blunt; posterior borders of large tergites moderately emarginate; posterior angles of T.9, 11 and 13 with triangular projections; intermediate tergite emarginate posteriorly. *Coxal pores*: 6, 7, 6, 5 or 6, 7, 7, 5 (5, 5, 6, 5 in immature male); oval or slightly oblong. *15th leg*: about two-fifths of body-length; femur modified in male; accessory apical claw very small, a fifth to a quarter the length of principal claw. *Male secondary sexual characters*: the dorsal aspect of the distal end of the 15th femur bears a prominent wart-like outgrowth arising from a shallow circumscribed depression (Fig. 35). *Female gonopod*: coxa with two long slender spurs separated from one another at their insertions by about their own breadth; the spurs appear acuminate when viewed laterally but blunt and somewhat serrated apically when viewed ventrally; claw with a large internal (dorsal) denticle and a much smaller external (ventral) denticle (Fig. 36).



FIGS. 33–36. *Lithobius sydneyensis.* Fig. 33. Ocelli. Fig. 34. Dental margin of prosternum, ventral. Fig. 35. Left 15th femur of ♂, posterior (internal). Fig. 36. Left ♀ gonopod, ventral.

Spinulation of lectotype (male) :

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1–2	—	—	mp	amp	am	—	—	mp	ap	a
3–9	—	—	mp	amp	am	—	—	mp	ap	ap
10–11	—	—	mp	amp	am	—	—	amp	ap	ap
12	—	—	amp	amp	am	—	—	amp	ap	ap
13	—	m	amp	amp	am	a	—	amp	p	ap
14	—	m	amp	amp	a	a	—	amp	p	p
15	—	m	amp	amp	a	a	—	amp	p	p

In addition to the above there are two supplementary posterior prefemoral spines on each 15th leg (Fig. 35) ; VaF is duplicated on the right 15th leg.

In the female 1VmP, 15VpF, 14DpT, 15DpF and 15DpT are absent; 12VmT, 2DpT and 9DaP are present; the two supplementary prefemoral spines are present on the 15th legs but 15VaF is simple on both sides.

REMARKS. *Walesobius* was erected by Chamberlin (1920b) as a monotypic genus, characterized by the male 15th femoral protuberance, to receive *L. sydneyensis*.

Although Brölemann's (1924a) description of *L. araichensis* from Morocco differs from Pocock's specimens of *L. sydneyensis* in the smaller number of ocelli (9 to 11), the circular coxal pores, and the presence of only one supplementary prefemoral spine on the 15th leg, examples of both sexes of *araichensis* from Gibraltar in the Collection of the Cave Research Group of Great Britain in the British Museum (Natural History) have been compared with those of *sydneyensis* and there is no doubt that the two forms are conspecific. *Walesobius excrescens* from Cape Town (South Africa) was described by Attems (1928) as having coxal pores exactly as in the Gibraltan specimens (4, 5, 5, 3; circular), a simple 15th apical claw and the large ocellus anterior to the smaller ocelli (10 + 1): but the 15th accessory apical claw is very small in *sydneyensis* and was overlooked by both Pocock and Archey (1937), and Attems' description of the ocelli may well have suffered mistranslation as the arrangement he gave is so unusual as to be barely credible: there is little doubt that *sydneyensis* and *excrescens* are conspecific. *Lithobius platensis* Gervais as described by Silvestri (1899), *Chilebius coquimbo* (Chamberlin 1955) and *Andebius callao* (Chamberlin 1955) cannot be separated from *L. sydneyensis* by their rather brief descriptions, but their identity is less certain. Synonymy of *L. bermudensis* Pocock from Bermuda with *L. sydneyensis* is discussed below (p. 63).

This species, as well as occurring in Morocco and Gibraltar, is widespread in southern Spain (Matic 1959, 1968). If we assume that this is its natural range and that it has been introduced to Bermuda, it might also have been spread artificially along the trade-routes to such seaports as Sydney, Auckland (New Zealand), where it was discovered by Archey (1937), and Cape Town. This suggestion is supported by the fact that there are few, if any, indigenous species of Lithobiidae in Australasia or South Africa in both of which regions the Lithobiomorpha is represented almost exclusively by the Henicopidae.

Lithobius platensis (*sensu* Silvestri) was recorded by Silvestri (1905) from Quinta Normal (Chile), Buenos Aires (Argentina) and Montevideo (Uruguay), while *Chilebius coquimbo* and *Andebius callao* were recorded from Coquimbo (Chile) and Callao (Peru) respectively by Chamberlin (1955). It is possible that these records, all from seaports or coastal localities, also refer to *L. sydneyensis*; but an indigenous species of Lithobiidae is known to occur in South America (Turk 1955) and *L. platensis* (which is probably conspecific with *Chilebius coquimbo* and *Andebius callao*) may be another.

11. ***Lithobius bermudensis*** Pocock

Lithobius bermudensis Pocock, 1893: 126.

TYPE LOCALITY. Bermuda.

MATERIAL EXAMINED. A jar labelled "*Lithobius* (s.s.) *bermudensis* Pocock, Bermuda, Challenger, 92.12.1.21" contains a female of *Lithobius sydneyensis* Pocock which is shrivelled, deeply pigmented and broken in two.

TYPE SPECIMEN. Pocock's description is of a single female and the above specimen is the holotype (Reg. no. 1892.12.1.21).

DESCRIPTION OF HOLOTYPE. The specimen is very defective and the following description is necessarily rather incomplete, but it is so close to Brölemann's (1924a) description of *L. araichensis* (=*sydneyensis*) and the Gibraltan examples of this species which have been examined (see p. 62) that there is little doubt as to its identity.

Length: about 14 mm. *Antennae*: broken. *Ocelli*: 1 + 4, 3, 2. *Prosternum*: with 2 + 2 teeth and distinct shoulders lateral to the lateral spines. *Tergites*: somewhat distorted but the general shape of the tergites and the posterior projections on T.9, 11 and 13 are as in *L. sydneyensis*. *Coxal pores*: 4, 5, 5, 4; circular. *15th leg*: the apical claw has been broken off, but Pocock noted the presence of an accessory claw. *Female gonopod*: as in *L. sydneyensis*.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
14	—	m	amp	amp	a	a	—	amp	p	p
15	—	m	amp	am	a	a	—	amp	p	—

In addition to the above there is a single supplementary posterior prefemoral spine on each 15th leg.

REMARKS. Pocock realized that *L. bermudensis*, like *L. provocator*, was not an "Antillean" species but he was unable to identify it with any species known to him. Chamberlin (1920a) believed it to be an immature stadium of *L. provocator* (=*peregrinus*). The fact that it proves to be *L. sydneyensis* is not surprising as we have already seen how this species seems to have spread far beyond its natural range in the western Mediterranean (see p. 62). Bollman's (1889) doubtful record of *L. lapidicola* Meinert from Bermuda may also refer to *L. sydneyensis*.

12. ***Lithobius persicus*** Pocock

(Figs. 37 and 38)

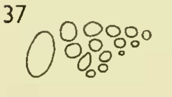
Lithobius persicus Pocock, 1899 : 399.
Alokobius persicus : Attems, 1927 : 245.

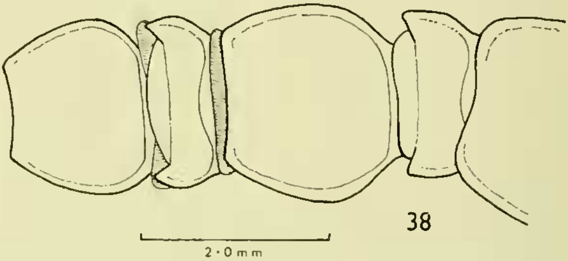
TYPE LOCALITY. Seir, Persia.

MATERIAL EXAMINED. A jar labelled "*Lithobius persicus* Pocock, type, 1900.1.15.2" contains a tube labelled "Seir 18.viii, coll. by R. T. Gunther". A male pierced longitudinally by a pin.

TYPE SPECIMEN. Pocock's description is of a single male and the above specimen is the holotype (Reg. no. 1900.1.15.2).

DESCRIPTION OF HOLOTYPE. *Size*: 19 mm long and 2·2 mm broad at T.10. *Colour*: dull brown. *Shape*: almost parallel-sided; T.1 rather narrower than T.3; body broadest at T.10. *Head*: distorted but probably broader than T.1; frontal sulcus very marked. *Antennae*: 7·0 mm long, of 47 articles. *Ocelli*: 1 + 5, 4, 3, 2 (Fig. 37). *Prosternum*: with 2 + 2 teeth; lateral spine slender but stouter than setae, placed immediately posterolateral to lateral tooth; lateral to the spine the anterior border appears to slope backwards without formation of shoulders, but its detailed structure is obscured owing to its being damaged by the pin. *Tergites*: posterior angles of T.8 and 10 rounded, those of T.12 and 14 blunt; posterior borders of large tergites feebly emarginate; posterior angles of T.9 obtuse, those of T.11 with feeble projections, those of T.13 with more marked projections (Fig. 38); intermediate tergite moderately emarginate posteriorly. *Coxal pores*: 3, 4, 4, 4; circular; separated from one another by more than their own diameter. *14th leg*: with an accessory apical claw. *15th leg*: 5·5 mm long; accessory apical claw absent. *Male secondary sexual characters*: 14th tibia not sulcate although Pocock mentioned a dorsal sulcus on this article; 14th femur with a feeble dorsal sulcus; 15th tibia with a distinct shallow dorsal sulcus.





FIGS. 37–38. *Lithobius persicus*. Fig. 37. Ocelli. Fig. 38. 11th to 14th tergites, dorsal.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	mp	amp	amp	—	—	mp	ap	—
2–11	—	—	mp	amp	amp	—	—	amp	ap	ap
12	—	—	amp	amp	amp	—	—	amp	ap	ap
13	—	m	amp	amp	am	a	—	amp	ap	ap
14	a	m	amp	amp	am	a	—	amp	p	p
15	a	m	amp	amp	am	a	—	amp	p	—

REMARKS. *Alokobius* was erected by Attems (1926) to receive species such as *L. persicus* with some modification of the male 14th or 15th tibiae; it was later reduced to a subgenus of *Lithobius* (Attems 1938) and most authors disregard it altogether.

L. persicus is not easily recognizable from Pocock's description which gives 42 antennal articles, a dorsal sulcus on the 14th as well as the 15th tibia, and square posterior angles on T.11; but no species resembling the holotype at all closely has been rediscovered in spite of fairly extensive collecting in Persia and Iraq (Brölemann 1922, 1923; Attems 1951; Chamberlin 1958; Matic 1969). The species probably belongs to the same group as *L. laccatus* Attems, 1951 and *L. easoni* Matic, 1969.

13. ***Lithobius doriae*** Pocock

Lithobius (*Archilithobius*) *doriae* Pocock, 1890: 63.
Lithobius doriae: Brölemann, 1898: 190; Verhoeff, 1937a: 203; Matic, 1970: 37.
Lithobius mediterraneus Chalande, 1903: 221; 1905: 72.
Lithobius pilicornis doriae: Brölemann, 1930: 299, and most subsequent authors.
Lithobius doriae uccianensis Verhoeff, 1943: 15.

TYPE LOCALITIES. Busalla, Finale and Isoverde, Italy.

MATERIAL EXAMINED. A jar labelled "*Archilithobius doriae* (Pocock), type, 1889.3.8.25–26" contains the following two tubes:

"*Lith.* (*Arch.*) *busallae* (Pocock), Finale, O. Thomas (c & p)." An immature female (Reg. no. 1889.3.8.25).

"*Lith.* (*Arch.*) *busallae* (Pocock), Busalla, O. Thomas (c & p)" [the word 'busallae' has been crossed out and 'doriae' substituted]. Five males and seven females of *L. doriae* together with a female of *Lithobius castaneus* Newport and a female of *Lithobius piceus verhoeffi* Demange (Reg. no. 1889.3.8.26). The last two specimens have now been separated from those of *L. doriae*.

TYPE SPECIMEN. Pocock's description was based on a number of specimens from Busalla, one from Finale and one from Isoverde (all in Liguria, Italy), the last of which has not been found. The best preserved specimen from Busalla, a male 17 mm long, is here formally designated as the lectotype and has now been placed in a separate tube (Reg. no. 1889.3.8.26 (part)).

DESCRIPTION. In general agreement with Brölemann's (1930) description of *L. pilicornis doriae*. Of the variable features, the prosternal teeth are usually 4 + 4 but four specimens have 4 + 5, 4 + 6, 5 + 5 and 5 + 7 teeth respectively; the posterior angles of T.13 have small but distinct projections, and in a few specimens those of T.11 have very feeble projections; the coxal pores are usually 5, 6, 6, 5 or 5, 7, 7, 5, oblong in the larger and oval or almost circular in the smaller specimens; on the 15th leg the spines VaC (coxolateral) and VmC are always present; on the 14th leg VaC is present in most specimens and VmC in one only.

REMARKS. The subgenus *Archilithobius* in which Pocock placed *L. doriae* was erected by Stuxberg (1875) to receive all those species without marked posterior tergal projections: it is now disregarded by most authors but Attems (1926) and Chamberlin (1952) have used the name for two different species-groups neither of which includes *L. doriae*. *L. mediterraneus* from the south of France has long been recognized as a synonym of *L. doriae*. *L. doriae uccianensis* from Corsica was described as having the coxal pores oval, no more than twice as broad as long, and the spine VmC present on the 14th as well as the 15th leg (Verhoeff 1943): since both these features are found in one or other of the syntypes from Busalla the subspecies *uccianensis* should be disregarded. All the features separating *L. doriae* from *L. pilicornis* Newport are such as would be expected from its smaller size and, since the two forms are not known to be truly sympatric, Brölemann was probably correct in regarding them as no more than subspecifically distinct.

Pocock must first have named this form *L. busallae* but the name was never published.

14. ***Lithobius birmanicus*** Pocock

(Figs. 39 to 41)

Lithobius (*Archilithobius*) *birmanicus* Pocock, 1891b : 407.
Archilithobius birmanicus : Attems, 1914 : 97.
Lithobius (*Australobius*) *birmanicus* : Attems, 1938 : 345.
Archilithobius birmanicus var. *chandellensis* Larwood, 1949 : 136, figs. 3a–f.

TYPE LOCALITIES. Tharrawaddy and Palon, Burma.

MATERIAL EXAMINED. A jar labelled " *Lithobius* (*Arch.*) *birmanicus* (Pocock), 89.7.15.75, Tharrawaddy, E. W. Oates (c & p) " contains five males and four females, all mutilated, and one specimen so defective as to be unrecognizable.

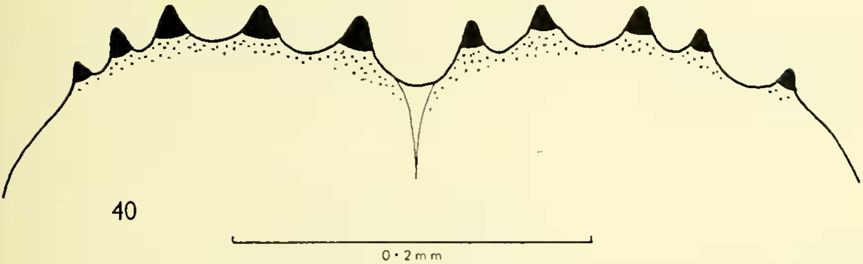
TYPE SPECIMEN. Pocock's description was based on a number of specimens from Tharrawaddy and Palon, Burma. No material from Palon has been found and the best preserved specimen from Tharrawaddy, a male 9·0 mm long, is here formally designated as the lectotype and has now been placed in a separate tube (Reg. no. 1889.7.15.75 (part)).

DESCRIPTION. *Size*: 8·0 to 9·5 mm long and 1·0 to 1·1 mm broad at T.10. *Colour*: dull yellow. *Shape*: fusiform; T.1 rather narrower than T.3; body broadest at T.8 or 10. *Head*: barely broader than long, about as broad as T.8 or 10. *Antennae*: almost half body-length, of 20 articles which become progressively more elongate distally. *Ocelli*: 1 + 3, 1 (Fig. 39) or 1 + 3, 2. *Prosternum*: with 4 + 4, 4 + 5, 5 + 5 or 5 + 6 teeth; lateral tooth or lateral two teeth smaller and placed more posteriorly than others; no lateral spine; lateral to lateral tooth the anterior border curves backwards without angulation (Fig. 40). *Tergites*: posterior angles of T.8 and 10 rounded, those of T.12 and 14 rounded or blunt; posterior borders of large tergites moderately emarginate; posterior angles of T.9, 11 and 13 obtusely rounded; intermediate tergite feebly emarginate posteriorly. *Coxal pores*: 2, 4, 4, 3; 3, 3, 4, 3; 3, 4, 4, 3; 3, 4, 4, 4 or 3, 5, 5, 4; circular; separated from one another by less than their own diameter. *Tarso-metatarsal articulations of anterior legs*: with, at most, a faint indication of an articulation. *15th leg*: missing in all specimens; according to Pocock the accessory apical claw is present. *Female gonopod*: coxa with two or three conical spurs set close to one another; when there are three the internal spur is much smaller than the others; claw tridentate (Fig. 41).

Spinulation of lectotype :

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
13	—	m	amp	amp	m	a	—	amp	p	p
14	—	m	amp	amp	—	a	—	amp	p	—

15th coxa without lateral spine (VaC).



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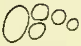

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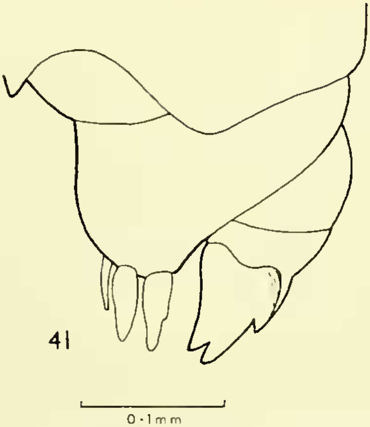

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FIGS. 39–41. *Lithobius birmanicus*. Fig. 39. Ocelli. Fig. 40. Dental margin of prosternum, ventral. Fig. 41. Left ♀ gonopod, ventral.

REMARKS. Attems (1914) and Larwood (1949) seem to have accepted the genus *Archilithobius* in Stuxberg's (1875) original sense (see p. 65) but *L. birmanicus* would not be included in *Archilithobius* as later emended by either Attems (1926) or Chamberlin (1952). *Australobius*, on the other hand, was erected by Chamberlin (1920b) to receive an Australian species (*A. scabrior* Chamberlin, probably introduced to Australia from the East Indies) and is characterized by antennae of only about 20 articles, relatively few large ocelli arranged in a compact mass, 3 + 3 or more prosternal teeth, frequent absence of the prosternal lateral spine and usually three or more spurs on the female gonopod. *L. birmanicus* and the next four species all seem to belong to *Australobius* which is distributed chiefly in India and south-east Asia.

Pocock described the 15th leg of *birmanicus* with only a single ventral spine each on the trochanter, prefemur and femur, but this reduced spinulation of the 15th leg is hardly credible when associated with the profuse ventral spinulation found on the 14th leg of the lectotype, and Pocock's description was probably based on an abnormal or regenerating leg. Larwood's naming of a new variety from India, *chandellensis*, characterized by three ventral spines on the prefemur and two on the femur of the 15th leg and agreeing with the lectotype in other respects (Larwood 1949) was not justified.

15. *Lithobius feae* Pocock

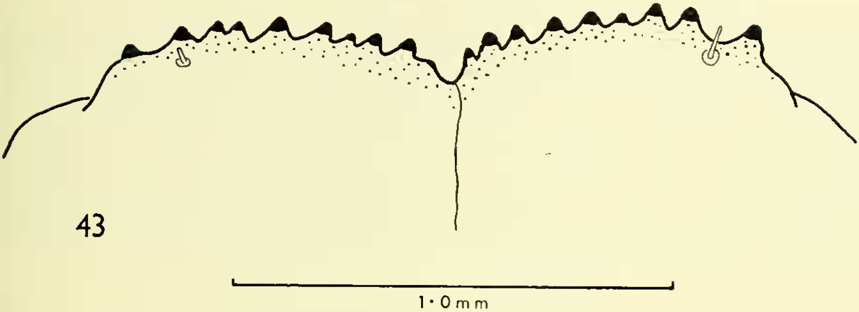
(Figs. 42 to 44)

Lithobius feae Pocock, 1891b : 408; Attems, 1914 : 97; Silvestri, 1917 : 307, fig. I 1–13.
Lithobius (*Australobius*) *feae* : Attems, 1938 : 345; 1953 : 152.
Burmobius feae : Chamberlin, 1944b : 14.

TYPE LOCALITY. Mount Mooleyit, Burma.

MATERIAL EXAMINED. A jar labelled "*Lithobius feae* Poc.? North Chin Hills (Upper Burma) E. Y. Watson, 93.11.12.3" contains a mutilated female. The single female on which Pocock's description was based was collected by Sig. L. Fea on Mount Mooleyit in Tenasserim (Lower Burma) so that the female in the British Museum (Natural History) cannot be the holotype: nor should it be selected as neotype because the North Chin Hills are too far from the type locality. However, there is no doubt as to its identity and as the only full description of *L. feae* in the literature, that of Silvestri (1917), was based on specimens from India, the female from the North Chin Hills is described below.

DESCRIPTION. *Size*: 20 mm long and 2·4 mm broad at T.10. *Colour*: destroyed by partial clearing. *Shape*: parallel-sided; T.1 broader than T.3, almost as broad as T.10; body broadest at T.8 and 10. *Head*: broader than long, as broad as T.10. *Antennae*: 7·5 mm long, of 20 very elongate articles, particularly those of the distal one-third which are two or three times longer than broad. *Ocelli*: 1 + 3, 2 (Fig. 42). *Prosternum*: with 9 + 9 teeth; lateral tooth set a little apart from the others and placed slightly more posteriorly, leaving a rather indefinite diastema; lateral spine minute, setiform, inserted immediately posterior or posteromedial to the diastema; since all the prosternal setae are missing the size of the lateral spine relative to that of the setae cannot be estimated but it is probably more slender and almost certainly much shorter than the largest of the setae; the whole dental margin projects slightly forwards from the rest of the prosternum (Fig. 43). *Tergites*: posterior angles of T.8 and 10 blunt, those of T.12 and 14 angulated; posterior borders of larger tergites broadly and increasingly emarginate from before backwards; posterior angles of T.7 with feeble broad projections, those of T.9, 11 and 13 with increasingly long rather blunt projections; intermediate tergite strongly emarginate. *Coxal pores*: 5, 6, 6, 6; oval or circular; separated from one another by about half their own diameter. *Tarso-metatarsal articulations of anterior legs*: fully developed and functional. *14th and 15th legs*: missing; according to Silvestri (1917) accessory apical claws are present on both. *Gonopod*: coxa with four conical spurs set fairly close to one another, the internal spur very small; claw simple (Fig. 44).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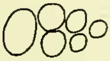
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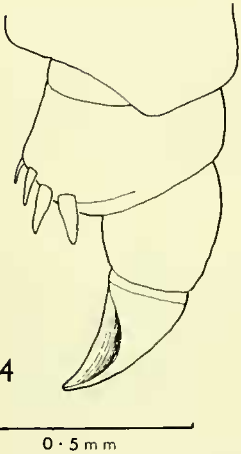
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FIGS. 42–44. *Lithobius feae.* Fig. 42. Ocelli. Fig. 43. Dental margin of prosternum, ventral. Fig. 44. Left ♀ gonopod, ventral.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	—	amp	m	—	—	amp	a	a
2–7	—	—	p	amp	am	—	—	amp	ap	a
8	—	—	p	amp	am	—	—	amp	ap	ap
9–12	—	—	mp	amp	am	—	—	amp	ap	ap
13	—	m	amp	amp	am	a	—	amp	ap	ap

Lateral spine (VaC) present on 15th coxa only.

REMARKS. *Burmobius* was erected by Chamberlin (1944b) as a monotypic genus, characterized by the presence of a prosternal diastema in addition to the general features of *Australobius*, to receive *L. feae*. *Burmobius* is, therefore, equivalent to *Alloporodontius* Verhoeff which was erected as a subgenus of *Lithobius* to receive a number of Malayan species (Verhoeff 1937b) and was characterized in exactly the same way. But the prosternal diastema is not a striking feature in the specimen of *L. feae* from Upper Burma and was not noticed by Pocock in the original specimen. There is no evidence of Chamberlin having examined a specimen himself and he must have based *Burmobius* on Silvestri's illustration of the prosternum of an Indian specimen which shows a diastema between the four lateral and four medial teeth (Silvestri 1917 : fig. I 11). It may be that this intermediate position of the prosternal diastema characterizes an Indian subspecies of *L. feae* but it is more likely that the exact position and even the existence of a diastema are variable in this species.

16. ***Lithobius weberi*** Pocock

(Figs. 45 and 46)

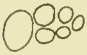
Lithobius (*Archilithobius*) *weberi* Pocock, 1894 : 310, Pl. 19 fig. 2.
Archilithobius javanicus : Attems, 1907 : 89 (non Pocock, 1894).
Archilithobius weberi : Attems, 1914 : 97.
Monotarsobius javanicus : Attems, 1914 : 97.
Tamulinus japanicus : Attems, 1927 : 244 (typ. error).
Lithobius (*Australobius*) *weberi* : Attems, 1938 : 345.
Lithobius (*Tamulinus*) *javanicus* : Attems, 1938 : 345.
Lithobius (*Australobius*) *javanicus* : Attems, 1953 : 151.

TYPE LOCALITIES. Manindjau and Mount Singalang, Sumatra.

MATERIAL EXAMINED. A jar labelled "*Lithobius javanicus* Pocock, *weberi* Pocock, type, 1896.10.6" contains a tube labelled "*Lithobius weberi* Pocock, type, Manindjau (Sumatra)". A male with the 13th, 14th and 15th legs missing.

TYPE SPECIMEN. Pocock's description was based on two males, one from Manindjau and one from Mount Singalang. The latter has not been found and the specimen from Manindjau is here formally designated as the lectotype (Reg. no. 1896.10.6.92).

DESCRIPTION OF LECTOTYPE. *Size*: 12 mm long and 1·6 mm broad at T.10. *Colour*: dull red. *Shape*: fusiform; T.1 as broad as T.3; body broadest at T.8 and 10. *Head*: broader than long, rather broader than T.5. *Antennae*: 4·0 mm long, of 20 slightly elongate articles. *Ocelli*: 1 + 3, 2 (Fig. 45). *Prosternum*: with 3 + 3 teeth all of much the same size; no lateral spine; lateral to lateral tooth the anterior border slopes gradually backwards without angulation (Fig. 46).



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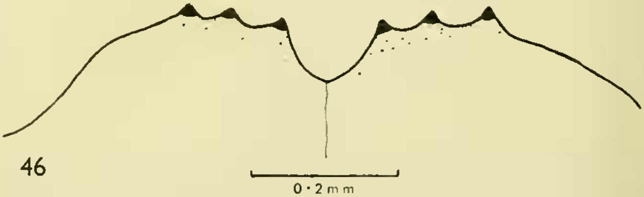

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FIGS. 45–46. *Lithobius weberi*. Fig. 45. Ocelli. Fig. 46. Dental margin of prosternum, ventral.

Tergites: large tergites with posterior angles rounded and posterior borders moderately emarginate; posterior angles of T.9, 11 and 13 squared; intermediate tergite feebly emarginate posteriorly. *Coxal pores*: 2, 3, 4, 3; circular; separated from one another by about their own diameter. *Tarso-metatarsal articulations of anterior legs*: with, at most, a faint indication of an articulation. *13th, 14th and 15th legs*: missing.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	p	a	—	—	—	amp	a	a
2–8	—	—	p	am	m	—	—	amp	ap	a
9–11	—	—	p	am	am	—	—	amp	p	a
12	—	—	p	m	am	—	—	amp	p	p

13th to 15th coxae without lateral spines (VaC); dorsal spine (DaC) present on 15th coxa only.

REMARKS. Attems (1907) described a single male from Buitenzorg (Java) which he identified as *Archilithobius javanicus* (Pocock) but there is no doubt that this specimen should have been referred to *L. weberi*: all Attems' subsequent references to, and brief descriptions of, *javanicus* were presumably based on this specimen as there is no evidence of his ever having seen an example of the true *L. javanicus*. His references to *weberi*, on the other hand, seem to have depended solely on Pocock's description and records.

As in the case of *L. birmanicus*, *L. weberi* would only be included in *Archilithobius* in Stuxberg's (1875) original sense. Attems (1914), finding that his specimen had fused tarsal articulations on the 1st to 13th legs, transferred "*javanicus*" (=*weberi*) to *Monotarsobius*, a genus erected by Verhoeff (1905) to receive those species with fused anterior tarsal articulations and only 19 to 22 antennal articles: at the same time Attems left *weberi* in *Archilithobius* on the assumption that these articulations are free in that species. He later (Attems 1927) transferred "*javanicus*" from *Monotarsobius* to *Tamulinus*, a genus he had himself erected (Attems 1926) to include those species excluded by Verhoeff's (1907) revised and more restricted definition of *Monotarsobius* by the possession of more than 2 + 2 prosternal teeth. He finally (Attems 1953) discarded *Tamulinus* as a useful division and transferred the species to *Australobius* (see p. 67) where it certainly belongs.

17. ***Lithobius javanicus*** Pocock

(Figs. 47 and 48)

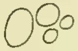
Lithobius (*Archilithobius*) *javanicus* Pocock, 1894: 311, Pl. 19 fig. 3.

TYPE LOCALITY. Tjibodas, Java.

MATERIAL EXAMINED. The jar labelled "*Lithobius javanicus* Pocock, *weberi* Pocock, type, 1896.10.6" contains a tube labelled "*Lithobius javanicus* Pocock, type, Tjibodas". A fairly well-preserved male.

TYPE SPECIMEN. Pocock's description is of a single male and the above specimen is the holotype (Reg. no. 1896.10.6.93).

DESCRIPTION OF HOLOTYPE. *Size*: 7·0 mm long and 0·9 mm broad at T.8. *Colour*: dull yellow. *Shape*: almost parallel-sided; T.1 as broad as T.3; body broadest at T.8. *Head*: barely broader than long, as broad as T.8. *Antennae*: 2·8 mm long, of 20 rather irregular articles. *Ocelli*: 1 + 2, 1 (Fig. 47). *Prosternum*: with 4 + 5 teeth; lateral tooth smaller and placed more posteriorly than others; no lateral spine; lateral to lateral tooth the anterior border slopes sharply backwards without angulation (Fig. 48). *Tergites*: posterior angles of T.8, 10, 12 and 14 blunt; posterior borders of large tergites very feebly emarginate; posterior angles of T.9, 11 and 13 rounded and very feebly projecting posteriorly; intermediate tergite feebly emarginate posteriorly. *Coxal pores*: 2, 2, 2, 2; circular; separated from one another by about their own diameter. *Tarso-metatarsal articulations of anterior legs*: quite distinct with a change in breadth of articles but no obvious flexion. *15th leg*: 2·5 mm long, not swollen or otherwise modified; accessory apical claw half the length of principal claw. *Male genitalia*: covered by genital sternite so that the specimen may be immature.



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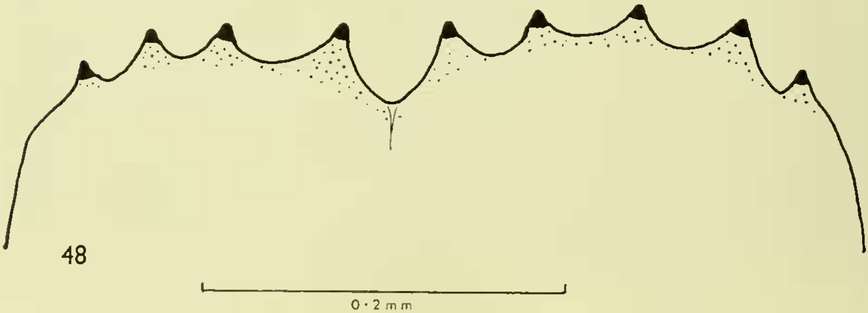

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FIGS. 47–48. *Lithobius javanicus*. Fig. 47. Ocelli. Fig. 48. Dental margin of prosternum, ventral.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
14	—	m	amp	m	—	—	—	mp	p	—
15	—	m	amp	m	—	—	—	mp	—	—

Spinulation of anterior legs very deficient and difficult to interpret accurately.

REMARKS. *L. javanicus* may be no more than subspecifically distinct from *L. birmanicus* from which it can only be separated by means of the shape of the tergites and the form of the tarso-metatarsal articulations of the anterior legs: the other distinctive features may all be due to immaturity of the holotype and the true status of *javanicus* will only be decided when adults of both sexes have been examined. It should be regarded, provisionally, as a valid species.

18. ***Lithobius sculpturatus*** Pocock

(Figs. 49 to 51)

Lithobius sculpturatus Pocock, 1901 : 449; 1906 : 1041.
Monotarsobius ceylanicus Attems, 1909 : 21; 1914 : 97.
Archilithobius sculpturatus : Attems, 1914 : 97.
Tamulinus ceylanicus : Attems, 1927 : 244.
Lithobius (*Tamulinus*) *sculpturatus* : Attems, 1938 : 345.
Lithobius (*Tamulinus*) *ceylanicus* : Attems, 1938 : 345.
Lithobius (*Australobius*) *ceylanicus* : Attems, 1953 : 151.

TYPE LOCALITY. Madras, India.

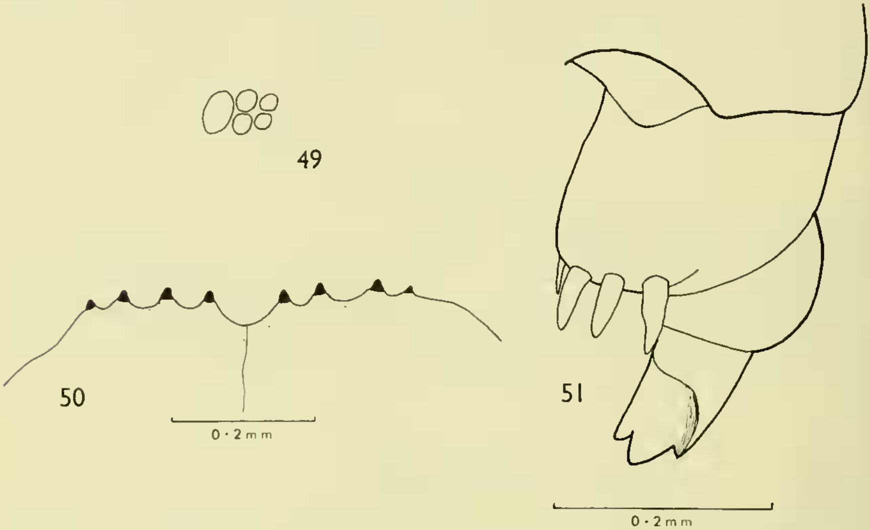
MATERIAL EXAMINED. A jar labelled "*Lithobius sculpturatus* Pocock, type, 1894.10.24.65–67" contains the following two tubes:

"Madras". A well-preserved female answering fairly well to Pocock's description (Reg. no. 1894.10.24.65).

"Kodaikanal". Two males differing from Pocock's description and belonging to another species to be described later in this paper (Reg. no. 1894.10.24.66–67).

TYPE SPECIMEN. Pocock implied that his description was based on a number of specimens from Kodaikanal (Palni Hills, southern India) and Madras, but he did not select any one specimen as type. The description was clearly based chiefly on the female from Madras which is conspecific with the specimens Pocock (1906) recorded as *L. sculpturatus* from the Maldive and Laccadive Islands, whereas the males from Kodaikanal are specifically distinct. The specimen from Madras is here formally designated as the lectotype (Reg. no. 1894.10.24.65).

DESCRIPTION OF LECTOTYPE. *Size*: 11·2 mm long and 1·25 mm broad at T.10. *Colour*: dark brown. *Shape*: feebly fusiform; T.1 broader than T.3; body broadest at T.8 and 10. *Head*: broader than long, as broad as T.10. *Antennae*: 3·6 mm long, of 20 fairly regular articles, mostly as broad as long. *Ocelli*: 1 + 2, 2 (Fig. 49). *Prosternum*: with 4 + 4 teeth; lateral tooth smaller and placed more posteriorly than others; no lateral spine; lateral to lateral tooth the anterior border slopes gradually backwards without angulation (Fig. 50). *Tergites*: posterior angles of T.8 and 10 rounded, those of T.12 and 14 blunt; posterior borders of large tergites moderately emarginate; posterior angles of T.9 obtuse, those of T.11 and 13 squared; intermediate tergite moderately emarginate posteriorly. *Coxal pores*: 4, 5, 5, 5 and 3, 5, 5, 4; circular; separated from one another by their own diameter. *Tarso-metatarsal articulations of anterior legs*: with, at most, a faint indication of an articulation. *15th leg*: 3·8 mm long; accessory apical claw half the length of principal claw. *Gonopod*: coxa with four conical spurs separated from one another at their insertions by rather less than their own breadth; internal spur very small; claw short, tridentate (Fig. 51).



FIGS. 49–51. *Lithobius sculpturatus*. Fig. 49. Ocelli. Fig. 50. Dental margin of prosternum, ventral. Fig. 51. Left ♀ gonopod, ventral.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	—	am	m	—	—	amp	a	a
2	—	—	p	am	m	—	—	amp	ap	a
3–8	—	—	p	amp	m	—	—	amp	ap	a
9	—	—	p	amp	m	—	—	amp	ap	ap
10	—	—	p	amp	am	—	—	amp	ap	ap
11	—	—	mp	amp	am	—	—	amp	ap	ap
12	—	—	mp	amp	am	—	—	amp	ap	p
13	—	—	amp	amp	a	—	—	amp	p	p
14	—	m	amp	amp	a	a	—	amp	p	p
15	a	m	amp	amp	a	a	—	amp	p	—

FURTHER SPECIMENS. Five males from the Maldive Islands and two females from the Laccadive Islands in the British Museum (Natural History) (Reg. no. 1952.12.11.73–78), on which Pocock (1906) reported, show general agreement with the lectotype but with the following variations: *Size*: 8·5 to 11 mm long. *Colour*: paler. *Antennae*: one male with only 19 articles. *Coxal pores*: 2, 3, 3, 3; 2, 3, 4, 3; 3, 3, 4, 3 or 2, 4, 4, 3. *14th and 15th legs*: slightly swollen in males. *Coxolateral spines* (*VaC*): present on 14th as well as 15th legs in one male. *Female gonopod*: with only three spurs in both specimens which may be immature.

REMARKS. Pocock overstated the number of ocelli in *L. sculpturatus* and also failed to record the single ventral tibial spine (VaT) on the 15th leg. Consequently Attems (1909) described a female from Pont de Galle, Ceylon, which clearly belonged to *sculpturatus*, as a new species, *Monotarsobius ceylanicus*, which he later designated as the type species of *Tamulinus* (Attems 1927). His generic classification of this species was much the same as for the specimen of *L. weberi* he identified as *javanicus* (see p. 71). Attems' references to the species by its correct name seem to have depended solely on Pocock's description. Like the last four species *L. sculpturatus* belongs to *Australobius*.

19. **Lithobius shimensis** Pocock

Lithobius shimensis Pocock, 1895b : 349.
Lithobius shinensis : Attems, 1914 : 97 (typ. error).
Lithobius (*Australobius*) *shimensis* : Attems, 1938 : 345 ; 1953 : 151.

TYPE LOCALITY. Tsu-Shima, Japan.

MATERIAL EXAMINED. A jar labelled "*Lithobius shimensis* Poc., Tsu-Shima, P. A. Holst, 91.11.15" contains two mutilated stadia agenitalis of *Bothropolys asperatus* (L. Koch, 1878).

TYPE SPECIMENS. The above two specimens are the syntypes (Reg. no. 1891.11.15.2A).

DESCRIPTION. 7·0 mm and 5·5 mm long and answering to Murakami's (1958) description of the agenitalis II of *Bothropolys asperatus*.

REMARKS. Pocock, mistakenly, described adult female gonopods in *shimensis* and as the multiseriate coxal pores characteristic of *Bothropolys* and related genera only appear in the more advanced post-larval stadia it is not surprising that Attems (1938), who was guided solely by Pocock's description, should have referred this form to *Australobius* of which it possesses all the essential features. In fact *Australobius* does not seem to occur in Japan (Takakuwa 1939, 1941a).

20. **Lithobius holstii** Pocock

(Figs. 52 to 54)

Lithobius Holstii Pocock, 1895b : 349.
Monotarsobius crassipes Holstii : Attems, 1909 : 19 ; 1914 : 97 ; Takakuwa, 1941b : 292, fig. 1 ; Chamberlin and Wang, 1952 : 183.
Monotarsobius takakuwai Verhoeff, 1937a : 193.

TYPE LOCALITY. Ashinoju, Japan.

MATERIAL EXAMINED. A jar labelled "*Lithobius holstii* Pocock, Ashinoju (Japan), P. A. Holst, 91.5.16.23. Tsu-Shima (Japan), P. A. Holst, 91.11.15" contains the following two tubes :

"Ashinoju (Japan), P. A. Holst". A well-preserved female (Reg. no. 1891.5.16.23).

" Tsu-Shima ". A very mutilated male (Reg. no. 1891.11.15.2B).

Type specimen. Pocock made it quite clear that his description was based on the female from Ashinoju and that the specimen from Tsu-Shima was mutilated when he examined it. The former is therefore the holotype (Reg. no. 1891.5.16.23).

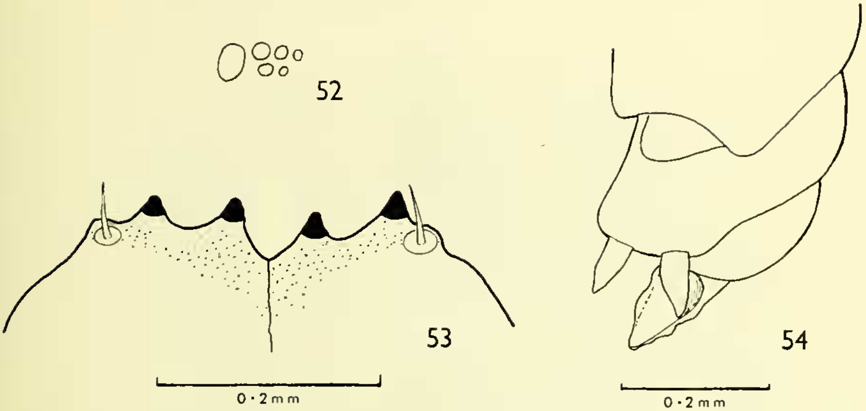
Description of holotype. *Size*: 8·0 mm long and 1·3 mm broad at T.10; the specimen is contracted and its length when alive must have been over 10 mm. *Colour*: yellow. *Shape*: fusiform; T.1 narrower than T.3; body broadest at T.10. *Head*: barely broader than long, as broad as T.3. *Antennae*: 3·2 mm long; the right antenna of 19 articles becoming increasingly elongate distally much as described by Verhoeff (1937a) in *Monotarsobius takakuwai*; the left antenna of 22 articles, all, including the terminal article, about as long as broad. *Ocelli*: 1 + 3, 2 (Fig. 52). *Prosternum*: with 2 + 2 teeth; lateral spine setiform, placed postero-lateral to lateral tooth; immediately adjacent to the insertion of the spine is a distinct node; lateral to the node the anterior border curves backwards without angulation (Fig. 53). *Tergites*: large tergites with posterior angles rounded and posterior borders moderately emarginate; posterior angles of T.9, 11 and 13 rounded, not projecting; intermediate tergite broad and moderately emarginate posteriorly. *Coxal pores*: 3, 4, 4, 4; circular; separated from one another by about their own diameter. *Tarso-metatarsal articulations of anterior legs*: fused. *14th leg*: moderately swollen. *15th leg*: moderately swollen; 3·2 mm long; accessory apical claw three-fifths of length of principal claw. *Gonopod*: coxa with two conical spurs separated from one another at their insertions by about their own breadth and diverging from one another towards their apices; claw simple but with both internal and external ridges irregular (Fig. 54).

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	—	—	m	—	—	—	—	a
2	—	—	—	—	m	—	—	—	a	a
3–8	—	—	—	am	m	—	—	p	ap	ap
9–10	—	—	m	am	m	—	—	p	ap	ap
11	—	—	mp	am	m	—	—	p	ap	ap
12	—	—	mp	am	am	—	—	amp	ap	ap
13	—	—	amp	amp	am	—	—	amp	p	p
14	—	m	amp	am	m	a	—	amp	p	—
15	—	m	amp	am	—	a	—	amp	p	—

DaC very small on 14th and 15th legs.

Remarks. The small number of antennal articles (19–22), 2 + 2 prosternal teeth, fused anterior tarsal articulations, and the absence of posterior tergal projections place *L. hostii* in *Monotarsobius* as redefined by Verhoeff (1907); but Attems (1909) was not justified in regarding this form as conspecific with *L.* (*Monotarsobius*) *crassipes* L. Koch from which it differs in many essential features. Pocock described the claw of the female gonopod as " obsoletely trifid " and this led Verhoeff (1937a) to name *Monotarsobius takakuwai* (from the neighbourhood of Tokyo)



FIGS. 52–54. *Lithobius holstii.* Fig. 52. Ocelli. Fig. 53. Dental margin of prosternum, ventral. Fig. 54. Left ♀ gonopod, ventral.

as a distinct species with a simple female genital claw. According to Takakuwa (1941b), who suggested the synonymy of *takakuwai* with *holstii*, the genital claw shows considerable variation in this species. One of the cotypes of *Monotarsobius takakuwai* Verhoeff in the British Museum (Natural History) (Reg. no. 1937.9.9.57), a male 11 mm long, is almost certainly conspecific with the holotype of *L. holstii.*

Lithobius palnis sp. nov.

(Figs. 55 to 58)

TYPE LOCALITY. Kodaikanal in the Palni Hills, India.

MATERIAL EXAMINED. The two syntypes of *Lithobius sculpturatus* Pocock from Kodaikanal (see p. 73).

TYPE SPECIMENS. Holotype adult male and paratype immature male. B.M. (N.H.) Reg. nos. 1894.10.24.66 (holotype); 1894.10.24.67 (paratype).

DESCRIPTION OF HOLOTYPE. *Size*: 10·8 mm long and 1·3 mm broad at T.10. *Colour*: brown. *Shape*: fusiform; T.1 rather narrower than T.3; body broadest at T.8 and 10. *Head*: broader than long, rather broader than T.5. *Antennae*: 3·8 mm long, of 20 articles; the basal article and numbers 3 to 7, 11 to 13 and 17 to 19 are as long as broad or slightly transverse; the second article and numbers 8 to 10 and 14 to 16 are distinctly elongate; the terminal article is very elongate. *Ocelli*: 1 + 2, 1 on right (Fig. 55); 1 + 3, 2 on left (Fig. 56). *Prosternum*: with 4 + 4 teeth; lateral tooth set a little apart from the others and placed slightly more posteriorly, leaving a distinct diastema; lateral spine setiform, inserted immediately posterior to the diastema; lateral to lateral tooth the anterior border slopes backwards without angulation (Fig. 57). *Tergites*: posterior angles of T.8 and 10 rounded, those of T.12 and 14 blunt; posterior borders of large tergites moderately emarginate; posterior angles of T.9, 11 and 13, rounded,

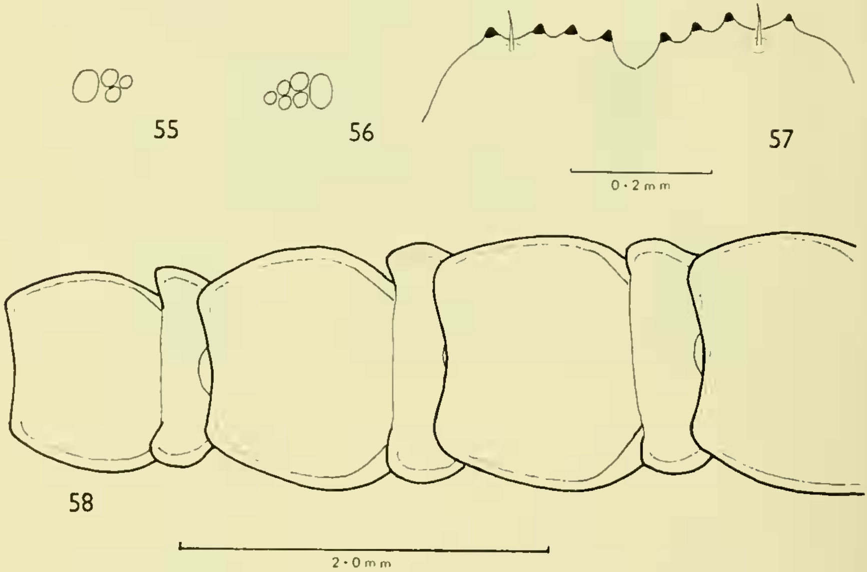
TABLE I

Nominal species	Date	Type locality	Designate type material	Validity and status
bermudensis	1893	Bermuda	Holotype	=*Lithobius sydneyensis* Pocock, 1891. SYN. NOV.
birmanicus	1891	Tharrawaddy, Burma	Lectotype	valid =*Archilithobius birmanicus* var. *chandellensis* Larwood, 1949. SYN. NOV.
decodontus	1895	Volcan de Acatenango, Guatemala	Holotype	valid
doriae	1890	Busalla, Italy	Lectotype	subspecies of *Lithobius pilicornis* Newport, 1844 =*Lithobius mediterraneus* Chalande, 1903 =*Lithobius doriae uccianensis* Verhoeff, 1943. SYN. NOV.
feae	1891	Mount Mooleyit, Burma	none	valid
godmani	1895	Amula, Guerrero, Mexico	Lectotype	valid
holstii	1895	Ashinoju, Japan	Holotype	valid =*Monotarsobius takakuwai* Verhoef, 1937
humberti	1895	Omilteme, Guerrero, Mexico	Lectotype	valid
javanicus	1894	Tjibodas, Java	Holotype	provisionally valid non *Archilithobius javanicus* : Attems, 1907
macroceros	1895	Omilteme, Guerrero, Mexico	Lectotype	valid =*Sotimpius multigranosus* Kraus, 1954 ?
persicus	1899	Seir, Persia	Holotype	valid
pontifex	1895	Amula, Guerrero, Mexico	Holotype	valid

TABLE I cont.

Nominal species	Date	Type locality	Designate type material	Validity and status
provocator	1891	Bermuda	Syntypes	=*Lithobius peregrinus* Latzel, 1880 =*Lithobius ethochaetus* Chamberlin, 1938. SYN. NOV.
salvini	1895	Omilteme, Guerrero, Mexico	Lectotype	valid
sculpturatus	1901	Madras, India	Lectotype	valid =*Monotarsobius ceylanicus* Attems, 1909. SYN. NOV.
shimensis	1895	Tsu-Shima, Japan	Syntypes	=*Bothropolys asperatus* (L. Koch, 1878). SYN. NOV.
stolli	1895	Volcan de Agua, Guatemala	Holotype	=*Lithobius castaneus* Newport, 1844. SYN. NOV.
sydneyensis	1891	Sydney, Australia	Lectotype	valid =*Lithobius bermudensis* Pocock, 1893 =*Lithobius araichensis* Brölemann, 1924. SYN. NOV. =*Walesobius excrescens* Attems, 1928. SYN. NOV. =*Lithobius platensis* Gervais : Silvestri, 1899 ? =*Chilebius coquimbo* Chamberlin, 1955 ? =*Andebius callao* Chamberlin, 1955 ?
vulcani	1895	Volcan de Agua, Guatemala	Holotype	valid =*Sotimpius zilchi* Kraus, 1954. SYN. NOV.
weberi	1894	Manindjau, Sumatra	Lectotype	valid =*Archilithobius javanicus* : Attems, 1907 (non Pocock, 1894)

those of T.11 and 13 very feebly projecting posteriorly (Fig. 58); the folds and tubercular elevations on the surface of the tergites noted by Chamberlin (1920b) in *Australobius scabrior* are present and most marked on T.10, 12 and 14, but they are no more pronounced than in the other species from India and south-east Asia; intermediate tergite moderately emarginate posteriorly. *Coxal pores*: 2, 3, 3, 3; circular; separated from one another by their own diameter. *Tarso-metatarsal articulations of anterior legs*: fully developed and functional. *14th leg*: slightly swollen. *15th leg*: slightly swollen; 3·8 mm long; accessory apical claw half the length of principal claw.



Figs. 55–58. *Lithobius palnis*. Fig. 55. Ocelli, right. Fig. 56. Ocelli, left. Fig. 57. Dental margin of prosternum, ventral. Fig. 58. 9th to 14th tergites, dorsal.

Spinulation:

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	—	—	—	—	—	—	—	p	a	a
2	—	—	p	a	—	—	—	mp	ap	a
3–4	—	—	p	a	m	—	—	amp	ap	a
5–6	—	—	p	am	m	—	—	amp	ap	a
7–9	—	—	—	am	m	—	—	amp	ap	a
10	—	—	—	am	m	—	—	amp	p	a
11	—	—	p	am	am	—	—	amp	p	a
12	—	—	p	am	am	(a)	—	amp	p	—
13	—	—	ap	amp	a(m)	a	—	amp	p	p
14	—	m	amp	amp	a	a	—	amp	p	—
15	—	m	amp	amp	a	a	—	amp	(p)	—

Letters in brackets indicate spines present on one side only.

Description of paratype. *Length*: 8·5 mm. *Antennae*: of 20 articles. *Ocelli*: 1 + 2, 2. *Prosternum*: with 4 + 3 teeth; lateral spine and diastema between the lateral two teeth on both sides. *Coxal pores*: 1, 2, 2, 2.

Remarks. The presence of a prosternal diastema places the new species in *Alloporodontius* Verhoeff (=*Burmobius* Chamberlin) and it is close to *Lithobius* (*Alloporodontius*) *malayicus* Verhoeff from Johore, Malaysia (Verhoeff 1937b). It differs from *malayicus* in the absence of distinct triangular projections on T.9, 11 and 13 and in the position of the prosternal spine and diastema which, in *malayicus*, are between the intermediate two teeth. There is some doubt as to whether *Alloporodontius* should be retained as a division distinct from *Australobius* (see p. 69), and the exact status of *Australobius* remains uncertain until more is known of the lithobiid fauna of India and south-east Asia.

ACKNOWLEDGEMENTS

I wish to thank the Trustees of the British Museum (Natural History) for allowing me to borrow specimens and Mr K. H. Hyatt of the Arachnida and Myriapoda Section of the Department of Zoology of the Museum for his personal help and for reading and criticizing my manuscript.

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